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EARLY BEHAVIOR PROBLEMS AS SIGNPOSTS TO LATER MALADJUSTMENT.*

By LEO KANNER, M. D., BALTIMORE, MD.

The term "behavior problems of children," as it is used in psychiatric literature as well as in common parlance, covers a vast territory. It includes the concomitants of alterations of cerebral tissue and endocrine functioning, deficiencies arising from inadequate endowment, failure to comply with standards of conventional conduct, the results of devious child rearing, gropings during the process of establishing daily routine and interpersonal relationships, and more or less disturbing reactions to situations involving anxiety, insecurity, resentment and frustration. There are problems representing incisive clashes of abilities, attitudes and performances with prime socializing necessities. There are problems portraying the struggle of inexperienced novices against the vicissitudes of their environment. And there are problems considered as such because of the nuisance value they have to parents, teachers or physicians more easily annoyed or alarmed than others.

The term "maladjustment" contains an equally broad generalization. It links together every conceivable mode of behavior that would find entry into textbooks of psychiatry and abnormal psychology. Since no human being is always ideally attuned to the complexities of living, adjustment and maladjustment are relative concepts subject in a large degree to arbitrary evaluation.

The correlation of children's behavior problems with maladjustment in later life would therefore seem like a thankless enterprise, similar to a pediatrician's attempt to correlate early somatic ailments with later indisposition. Application to other people of information derived from the study of any one person is made pointless because of the great multiplicity of variables. Statistical analyses are rendered meaningless by the absence of dependable figures.

*Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

When an adult seeks psychiatric help, investigation may reveal the presence in his childhood of deviations from frictionless behavior. But then, a detailed biographic account of *every* adult is bound to disclose a history of some such departures in the course of his formative years. Hence the departures, "problems," "symptoms" *per se* can hardly be made to form a basis for the recognition of directions. Even when there is evidence that a patient, showing marked difficulties in adult life, has had marked difficulties in childhood, this knowledge cannot suffice to establish a clear cause-and-effect relationship. It has been said, not without justification, that adult character and conduct are rooted in childhood. But fruit does not grow directly from the roots. That which is between the two ends is of not less dynamic significance than either end, especially since the root and the fruit themselves cannot be considered separately without their connections with soil, climate, weather and many other things. Any attempt to skip from either end to the other, disregarding the intervening evolution, would therefore be a naïve oversimplification. There are many excellent anamnestic records of schizophrenics, criminals and men of creative genius. Similarities between the early behavior of any of those and the behavior of a given child do not warrant the prediction that the child will become schizophrenic, a criminal or a creative genius. Psychoanalysis believes it can trace adult performances straight to infantile experiences; yet not even the cocksurest psychoanalyst could venture to prophesy a child's career from his infantile experiences.

The search for prognosis is doubtless an expression of wholesome curiosity of more than academic import. But search is not anticipated conclusion. The fate of Kraepelin's dementia præcox concept has made that sufficiently clear. Is it, indeed, possible or wise to think in terms of group prognosis or type prognosis in matters as complex, multifarious, variegated and ramified as human behavior and human adjustment? A psychiatrist when examining a patient does not depend on group retrospect or type retrospect. Unencumbered by generalities, he obtains the patient's personal, uniquely specific history. He *goes back with the patient*, retracing the thread of his development. He tries to understand the patient's difficulties, maps out a plan of treatment and then guides and observes the ensuing events. He allows those events, rather than a

one-time exercise in divination, to make a prognosis for him. Psychiatric prognosis, being witnessed in the making, thus becomes an individual, gradual, factual, definite process of *going forward with the patient*, with the complaint as a pivot, the biographic antecedents, personality equipment and variously mutable circumstances as potent determinants, and continued therapeutic steering as a regulating influence.

With this type of prognostic curiosity in mind, a follow-up system was instituted in 1934 at the Children's Psychiatric Service of the Harriet Lane Home, the pediatric department of the Johns Hopkins Hospital. A brief report of the plan and its organization was presented at the 1937 meeting of this Association.¹ Thus far the development of more than 500 children, first referred with complaints of behavior difficulties between 1930 and 1932, has been watched and recorded throughout the following years. Many are now adolescents, some have reached the voting age. Attention was paid to the original problem with its genetic-dynamic anamnesis and catamnesis, physical health, cognitive potentialities and their unfolding, environmental influences and impacts, extraordinary occurrences, family attitudes and relationships, conduct and progress at school, friendships and courtships, ambitions and vocational choice, and other factors which have meaning in the life of a growing person. The initial problems with which the children had been brought comprised all those major and minor disorders and perplexities which made the referring physicians feel that personal functions and relations were involved. They included undue resistiveness and aggressiveness, food and bowel capriciousness, enuresis, fear reactions, breath-holding spells and temper tantrums, inability to get along with children, daydreaming, habitual manipulations of the body, masturbation, speech difficulties, restlessness, tics, attack disorders, scholastic embarrassment, intellectual shortcomings, lying and stealing, direct results of parental mismanagement, hypochondriacal trends and somatogenic behavior anomalies.

The "neuroses" or "psychoneuroses" are a convenient chapter heading to the discussion of many dissimilar forms of behavior, as implicit as obsessive thinking and as overt as a grimacing tic, as mild as an occasional nightmare and as sweeping as a major hysterical attack, as transient as a reactive headache and as persistent as chronic invalidism. The customary subdivisions—ner-

vousness, neurasthenia, psychasthenia, anxiety states, hypochondriasis, motor neuroses and hysteria—amply demonstrate the heterogeneity of the assortment.

Reactions such as these have formed the nucleus of the complaints concerning many of the children included in the follow-up investigations. What has become of the "symptoms" and the patients in the 8 to 10 years which have elapsed since their first appearance at the Children's Psychiatric Service? A few case illustrations, selected because of manifestations usually considered under the heading "neuroses," may be of some help.

CASE I.—John H. was referred in 1931 at 9 years of age because of tics of one year's duration, restlessness, timidity, nailbiting and poor appetite. He was healthy except for dental caries and hyperopic astigmatism. His I. Q. was 117. He lived in constant dread that his alcoholic father might carry out the threat of leaving the family. He worried about his younger sister described as "run down" and "without pep" and his mother, who responded to the strain with crying spells and brief episodes of dysphonia. His "brooding" preoccupations interfered with his work in school.

John's teeth were repaired; his vision was corrected. His father was helped to give up his bibulousness and return to steadier employment. John was temporarily placed in a slower moving section of his grade. He was given an opportunity to express his feelings, attitudes and family relationships. He began to eat more and became less fearful, tense and fidgety. His scholastic standing improved quickly. A mild blinking tic persisted until 1934, when his mother reported that he "was rid of his twitchings altogether." Ruptured appendix made operation necessary in 1939. His father resumed his drinking after a few years. John is now, around the time of his eighteenth birthday, about to graduate from high school. He is a well-composed, popular, though not very sociable, somewhat overpolite young man, interested in chemistry, radio mechanics, photography and taxidermy. He has earned some money fixing radios. His tics have never returned.

CASE II.—William C. was referred in 1931 at 10 years because of facial and aerophagic tics, jerking in his sleep and lifelong food capriciousness. There was a history of night terrors before tonsillectomy in 1928. He had failed one grade at school. His condition of health was satisfactory. He had a slight congenital nystagmus. His I. Q. was 101. His father, an office clerk and the mother's second husband, had died in 1922. His two half-brothers were 12 and 14 years his seniors. William had for years been pampered, kept in bed for weeks at a time and taken to many physicians by his unintelligent, overprotective and uncooperative mother. He appeared immature, effeminate, lacking self-dependence. His classmates characteristically called him "Mary."

Despite psychiatric efforts, William continued to be his mother's "baby," making no attempt at emancipation. At 15 years, he was still not allowed to

travel alone in a street car. He failed several grades and was placed in a vocational class, where his progress was poor and his conduct that of a colorless, unimaginative drifter. His throat noises disappeared in 1933, his facial twitchings remained, especially during excitement and embarrassment. Now, at 19 years, he picks up occasional odd jobs which his mother, still hovering over him, considers below his dignity and worth. He displays no initiative, takes no particular interest in girls. His active, stable half-brothers have given up their efforts to find work for him and make him stick to it.

CASE III.—George H. was referred in 1930 at 9 years because of attacks of shortness of breath. He was in good health. His I. Q. was 118. His parents were stable middle-class people. The father had often dieted for "nervous indigestion." The mother was inclined to pamper George, the younger of two children, whose 19-year-old sister was a well-adjusted telephone operator.

George had, at one year, bronchitis of 4 weeks' duration. The parents were told that it might be the first episode of recurrent asthma. George was for years watched anxiously, and the quality of his breathing was discussed daily. Mild anterior poliomyelitis passed in 1928 without sequels. In 1930, one month after tonsillectomy under ether, the family moved to another section of the city. The new school was farther from home than the old had been. In the rush of the luncheon period at home George, who was upset about the disruption of previous associations, developed anxiety attacks with panting and fear of death. He was reassured about the dreaded "asthma." He was allowed to have luncheon at school. He was given opportunities for weekend visits with his former playmates. The attacks disappeared on the day of the first psychiatric consultation.

George is now, at 19 years, a college student in very good standing. He takes up chemical engineering. During vacations he works in an airplane factory and in the store managed by his father, and earns the greater part of his tuition. He is sociable, popular and has both boy friends and girl friends.

CASE IV.—Betty B. was referred in 1932 at 11 years because of obsessive-ruminative trends, poor appetite, fear of the dark and irritability. She copied her homework over and over again, washed her hands almost incessantly, went back repeatedly to make sure that other people's towels did not touch hers. She worried about her health, her studies, her impression on others, her future. She had always been very conscientious; teachers in earlier grades remembered her as a sensitive, perfectionistic pupil. Her physical health was good except for myopia and moderate underweight. Her I. Q. was 104. Her father, a tailor, was a gloomy, slow-moving man, for whom it was most difficult to make decisions. Her mother suffered from post-encephalitic Parkinsonianism. Her sister, 2 years older, was sociable and well-composed. A paternal uncle had suicided in a depression.

Betty, who felt unequal to attending school, was allowed to remain at home for a few days. She could not bring herself to return until two weeks

later, but then finished the term without much difficulty. Things went fairly well until early in 1934, when she became unusually quiet, lonely and listless. For the first time she really failed in one subject. Her obsessions returned, she felt that people were watching her, and spoke of suicide. Admitted to a hospital, she cried a great deal, had poor table manners, had feelings of unreality ("like it's make-belief"), had difficulty in following directions and spoke little. Discharged as markedly improved after 4 months, she returned to school but was absent most of the time. Her personal habits deteriorated. She put up a hard struggle, went to a camp for a short time, visited the hospital's occupational therapy department. But she gave up quickly, had more and more the feeling that nobody cared what she did and that it made no difference anyway. In any attempt to plan for Betty, her father, who never had an insight into her condition, made it impossible to do anything. Betty floated along until, in October, 1938, an acute excitement made state hospital commitment imperative. Betty is there now, at 19 years, apathetic, dependent on tube feeding for her nutrition, enuretic and encopretic, diagnosed as schizophrenic.

CASE V.—Grace T. was referred in 1930 at 10 years because of many hypochondriacal features. She was in good physical condition. Her I. Q. was 117. She was the younger of two children of stable, respectable parents. Following pneumonia at 2 years, she had been made the center of family solicitude and treated as a "sickly and delicate" girl, who was for years "nagged, coaxed, cajoled and punished." Grace kept her parents worried about her numerous pains, stomach aches, headaches and manual tremors and practiced a "cough" which was interpreted as a residual from her early illness. Her father's dieting because of gastric ulcer and a physician's suggestion that she had chronic appendicitis aggravated her food capriciousness. Her school work suffered because of long absences, shyness, self-pity and lack of self-confidence.

It took several months to convince her family that she was a healthy child. She was offered incentives which gave her a better sort of satisfaction than that derived from her habitual complaining. She joined a Camp Fire Girl troop. She took part in children's plays arranged in her church. Because of her considerable talent in drawing, she took special courses at the Art Institute. In 1932, she was entirely rid of her invalid reactions and had a wholesome attitude concerning her bodily functions.

Grace graduated from high school at 17 years. She married soon afterwards; her husband is a stable young man, steadily employed. Grace has just reached her twentieth birthday. She is a healthy person, who has normal interests, satisfactory social outlets, and there are no indications of "maladjustment."

These children have all been brought with so-called neurotic manifestations: tics, anxiety attacks, obsessions, hypochondriasis. Betty is at present dilapidated. William's social usefulness is at

present impaired. John, George and Grace are at present well adjusted. There will be further follow-up installments from time to time.

For the time being we must leave these persons precisely where they are now, somewhere on the road of life. We notice trends and directions shaping and sometimes reshaping themselves as life goes on. We are impressed by the incessant interplay of that which emanates *from* a person and that which happens *to* him. We get an informative glimpse of what mystified people are wont to speak of as fate. We observe integrative constellations, fluctuating within limits, of inherent potentialities, shifting circumstances or situational ruts, the impact of chance occurrences, and psychiatric opportunities for helpful modifications.

A few definite insights have so far emerged from our follow-up studies:

The sizing up of tendencies and goals does not depend on this or that "behavior problem" or "symptom," regardless of its place in any kind of classification, but on the problems and issues surrounding the difficulty complained of.² The complaint is an entering wedge, a starting point for planned investigation and treatment, the admission ticket to the psychiatrist's office.^{3, 4} It is futile to spend one's inquisitiveness on the course of "behavior problems," "neuroses" or any other pale abstraction or generalization, when real children present themselves with all the actuality, freshness, struggles, bafflements and promises of individual life on the way from birth to maturity.

(No one is capable of writing a biography ahead of events.) No one is even capable of writing a reliable biography after events unless he is thoroughly familiar with the facts as they actually occurred. No one could have predicted a brilliant oratorical career for the stuttering boy Demosthenes or the future of a grand scale incendiary for the ambitious boy Herostratus. Rigid prognostication does not make the necessary allowances for the rôle played by spontaneity, "chance" and unpredictable contingencies. Rigid prognostication tells more about the prognosticator's outlook than about the things that will happen to his patient.

Our follow-up studies have taught us to appreciate the value of biographies in installments, which afford vision free of both second sight and hindsight. The constellation of the moment offers a

challenge to ameliorative endeavor through work with the child, the family, the school, the community facilities for economic relief, recreation and rehabilitation. Successive reviews continue to bring information up to date and make it possible to readapt, when necessary and feasible, therapeutic measures to the developments as they take place. There is no obligation at any moment to expect perfection or paint devils on the wall. Prognosis becomes gnosis with perspective. Diagnosis, prognosis and treatment merge into one indivisible enterprise, which is at no time allowed to be obscured by fixed nomenclature, augury or immutability. This enterprise is based on the individualized consideration of the nature of the problem, the patient's make-up and experiences, the people who hold key positions in his doings and feelings, the assets that can be cultivated in him and his environment, and the collaborating relationship between the psychiatrist and the family group. If, under these circumstances, we go on doing the best we can with what we have at any given moment, determined to make of diagnosis, prognosis and treatment a planned and replanned long-range adventure, then we can—as indeed we always do—leave the rest to time, which still is and ever will be the most accurate and infallible judge of prognosis.

These considerations do not, of course, dispense with the need for orderly and organized grouping of personality syntheses and reaction patterns. The very plan of an extended follow-up survey is born of the hope that eventually collective individualization might lead to insights that go beyond the individual and beyond the temporary constellation. It hopes to learn from time, which it recognizes as a most enlightening instructor, tying up beginnings and ends through successive steps that lend themselves to fruitful study.

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DISCUSSION.

DR. LOUIS A. LURIE (Cincinnati, Ohio).—In this paper the author posits the question, "Is it indeed possible or wise to think in terms of group prognosis or type prognosis in matters as complex, multifarious, variegated and ramified as human behavior and human adjustment?" He then proceeds to answer the question in the negative.

Many years ago when the child guidance movement was in its infancy, practically the same question was asked regarding the possibility or wisdom of trying to discern the factors underlying behavior disorders of children. This question was also answered in the negative and for almost the same reasons as given by Dr. Kanner. Yet despite this attitude, the search for the causative factors and relationships went on apace until today there has been accumulated a considerable body of valuable data relative to the causes and motivation of human behavior.

I think the same will hold true regarding prognosis in behavior disorders of children, although possibly to a much less extent. Prognosis in any branch of medicine is a hazardous undertaking but it is especially so in the field of psychiatry and its related branches. Dr. Kanner rightly cautions us not to be too optimistic regarding our prognostic ability.

However, I feel that as more and more follow-up studies of children who have been studied at child guidance clinics are made, more and more data will be obtained that will reveal highly significant trends regarding the unfolding and developing of specific character traits, personality changes and emotional abnormalities from their beginning in childhood to their flowering in adulthood.

Dr. Kanner's paper is also of interest from another angle. As a result of this follow-up of case reports, he removes the fear implanted in many people by certain psychiatrists that the child's personality make-up and his basic patterns of behavior become fixed and unchangeable very early in life. At first this age was fixed at 5 years, then it was placed at 7-9 years, and now I understand that it has been fixed at 12 years. How this has been arrived at, whether by geometrical or arithmetical progression, I do not know. Dr. Kanner, like most of us, feels that these early patterns of behavior and character traits are immutable and fixed only to the extent that the factors comprising the constellations in which the child grows and develops are immutable, unchangeable and fixed.

DR. L. ERWIN WEXBERG (New Orleans, La.).—Dr. Kanner's paper will probably meet with the agreement or approval of those of you who have had some experience in child psychiatry. I believe he is basically right.

I would like to make a point in which I believe prognostic statements about children's behavior problems can be made, with much reservation. I believe we might distinguish in cases of behavior problems of children between personality symptoms and surface symptoms. Those four cases of Dr. Kanner's gave a good illustration. Personality symptoms or personality troubles are of the kind shown by the child with obsessional symptoms, or

the boy who was effeminate; whereas those every-day behavior troubles like fidgetiness, lack of progress in school, feeding troubles, justifiably are surface syndromes. I believe that in cases like that of the effeminate boy, of the child with obsessional symptoms, the prognosis has to be guarded. They are more likely to go on to more serious conditions. It came to my mind while I was listening to Dr. Kanner's paper that I was able, perhaps by chance, but I don't believe it was chance, to guess ahead of time the outcome.

DR. GEORGE S. SPRAGUE (White Plains, N. Y.).—I want to remark that the paper that Dr. Kanner has presented has given us another implication that he has not actually stated but has definitely implied, namely, that the emphasis has changed in our studies of cases. We used to study cases as adults. "What has the patient got?" Then we came to study the patient, still as an adult, but with the thought, "If we had only seen this case years ago, how much easier it would have been to give him adequate therapy."

Now Dr. Kanner has reversed the picture and brought us to a still earlier emphasis. We are seeing the patient years earlier before the adult problems have appeared, at a time when it is much more possible to give adequate therapy as well as study and prognostication. We might make the parallel to the embryonal quality of cell structure. We know the embryonal cell is one which carries on its functions with a speed and a quality of reversibility that the adult matured cells lack to some degree. In the same way we can see that children, if their problems are recognized early, have again this quality of speed and of intensity and of potential reversibility in the picture they present; and the possibility of therapy, as well as making the diagnosis, is the issue before us. The whole point as it seems to me is that Dr. Kanner indicates very good reason why we should examine the patient before examination has seemed necessary. Prophylaxis is better than cure.

DR. LEO KANNER (Baltimore, Md.).—I am in full agreement with Dr. Lurie, that after you have had experience with a large number of children, you will learn a great deal about things that have happened in the past and the way they have developed, and you can tell something about probable and possible and even perhaps often certain motivations and causations. But still Dr. Lurie has learned these things about those children after ten or fifteen or twenty years; and that brings us back to the same point at the beginning—Can we on the basis of what we have learned about 100 or 200 or 500 children make any kind of group prognosis on the basis of a symptom or diagnostic classification?

I read a few days ago a very illuminating paper by Dr. Meyerson, in which he said something about the tendency to look upon the psychiatrist as a Mr. Know-It-All or a Mr. Fix-It-All. Are we under obligation to be Mr. Know-It-Alls and people who want to be determined on the basis of this or that behavior in his childhood? That brings me to the discussion by Dr. Wexberg. The distinct personality symptoms and surface symptoms

represent something that depends on what we define as personality symptoms and as surface symptoms, the sort of things we want to put in the one or the other category. I can bring in any number of effeminate children or children with obsessions who do not at all justify any worry on anybody's part because of that.

I want to thank Dr. Sprague for his reënforcement of some of the points of view I tried to indicate.

PSYCHIATRY IN A GENERAL HOSPITAL.*

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AND

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In order adequately to study and treat psychiatric conditions in a general hospital, provision must be made for both hospital and out-patient cases. Those who enter the hospital wards usually do so on the basis of some physical complaint. After a period of observation, during which a program of therapy is formulated, the patients are referred to the family doctor or to the out-patient clinic for further care. Those who apply directly to the psychiatric clinics for treatment usually have more obvious nervous manifestation as their chief complaint, while their physical ailments remain secondary. Hence there is a distinct difference in the two groups at the beginning of their hospital contact. In the hospital bed case the physician must first take into consideration the physical complaints of the patient. An investigation of the emotional problems is initiated as a secondary measure and only gradually becomes the major part of the study and therapeutic program. In the clinic case, treatment from the beginning is primarily psychiatric, even though a careful and detailed physical study remains an important but distinctly secondary part of the program.

There are both advantages and disadvantages in the treatment of psychiatric problems in the general hospital wards. Among the disadvantages are the confusion and noise, anxiety exhibited by visitors, contact with multiple ailments, and the stress laid on physical methods of treatment, all of which handicap the nervous patient. There is the advantage of somewhat fixed surroundings with freedom from home responsibilities and contacts, and the reassurance of protective environment. The fact that a number of doctors, each with a different approach, are seeing the patient, gives little opportunity for the establishment of a satisfactory

* Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

rapport with any one physician, and yet has the advantage of establishing firmly in the mind of the patient the completeness of the study, and engenders confidence. The physical and emotional distress incident to the numerous examinations during a short period of hospitalization may be somewhat offset by the long hours of rest in bed and the opportunity to be waited upon. It is difficult to carry out a formal régime particularly applicable to the nervous case in an open medical ward, because of the continual unavoidable interferences. However on the whole, even a few days' hospitalization is a distinctly beneficial experience since it enables the patient to proceed with the extramural treatment program, fortified with the positive knowledge that a thorough physical and mental study has been made. On such a basis the physical complaints can be established in their proper perspective in relation to the sickness as a whole, and the patient rendered receptive to a sustained régime of psychotherapy.

Clinic practice has the distinct advantage of privacy in consultation with an opportunity to be interviewed repeatedly by the same physician, and thus to establish a confident patient-doctor relationship upon which to base a psychotherapeutic program. A patient who visits the clinic regularly for hour and half-hour appointments feels unhurried, and can discuss intimate personal problems in a leisurely manner with the assurance of a planned and constructive schedule of treatment. Although the clinic patient may be handicapped by having to live at home in the difficult environment in which the sickness arose, frequently continuing with work and responsibilities and often combating lack of cooperation or actual antagonism on the part of relatives toward the treatment, he is nevertheless more nearly meeting reality.

As an aid in the study of ward cases it has been found distinctly helpful to have available a small private room that can be used as a consultation office by the psychiatrist, where patients can be seen by appointment. During the interview an effort is made to help the patient understand that hospitalization has functioned as a period for observation and study and is only the beginning of treatment which is to be carried on at the clinic or by the family physician.

Since most patients seen by the psychiatrist on the medical wards return to the care of the family doctor, it is obviously important

that the general practitioner be trained in the handling of the psychoneuroses, so that he can carry through a proper psychotherapeutic program, much as is done in the psychiatric clinics. It is equally important that the doctor receive a detailed and comprehensive report to guide him in the future handling of the case, especially along psychiatric lines.

To emphasize further the intricate relationship of psychiatry to the general hospital wards and clinics, a detailed survey was made of the cases seen in psychiatric consultation on the wards and the psychiatric out-patient departments of the Jefferson Hospital. One hundred consecutive cases were studied in each unit. The ward cases were sub-divided into four major groups as follows:

SCHEDULE A.

SUBDIVISION OF ONE HUNDRED CASES INTO GROUPS AS PER CLASSIFICATION SET OUT IN THESIS.

Group.	No. of cases.
I. Mental problem direct outgrowth of physical condition..	12
II. Organic pathology present plus significant mental problem	51
III. Mental condition predominant problem—no significant organic pathology	30
IV. No demonstrable mental problem.....	7
Total	100

Group I includes cases in which the mental condition was largely the outgrowth of the physical disease. Through study by a psychiatrist the patients are much better understood and suitable nursing procedures and other helpful measures are instituted, such as are usually overlooked by the ordinary physician absorbed in the care of the physical illness.

Group II consists of cases in which some actual organic pathology of a significant nature (and of a sufficient degree to require treatment) was found, or in which there was a noteworthy physiological disturbance, presumably on a structural basis, but in addition clearly evident emotional factors were present and were of both etiological and therapeutic importance. Group II is further divided into sub-groups, namely Group 2a wherein the physical disease was frequently used to solve environmental prob-

lems, and in which there appeared to be no direct etiological relationship between the emotional factors and the physical disease; and Group 2b, those in whom a more or less direct relationship could be demonstrated.

Group III is composed of cases in which no noteworthy physical pathology could be found after a careful clinical and laboratory study, but in which the emotional factors were clearly the cause of the patients' complaint problems. This group, which is composed chiefly of cases showing a psychoneurotic reaction type, has also been subdivided according to the classification of The American Psychiatric Association.

SCHEDULE A1.

SUBDIVISION OF CASES IN GROUP I AS TO CORRELATED MENTAL PROBLEM.

	No. of cases.
1. Psychoses with other infectious diseases	
a. Pneumonia	2
b. Typhoid fever	1
2. Psychoses with other disturbances of circulation	
a. Hypertensive encephalopathy	4
3. Psychoses with cerebral arteriosclerosis.....	3
4. Psychoses due to other metabolic disease	
a. Hyperthyroidism	1
5. Epilepsy without psychoses.....	1
Total	12

Group IV consists of patients in whom some physical disease was present but no outstanding or apparently significant mental factors could be found.

Of Group I very little more need be said since it includes toxic and organic reaction types of mental disease commonly seen in any hospital and which present no new or unusual psychiatric problems.

Group II may be considered as especially important from several standpoints, therefore a separate study was made to demonstrate the relationship between somatic and psychiatric reaction types. (Schedule A2.) Each of these patients was found to have some form of organic pathology, and upon discharge from hospital the organic disease was listed as the primary diagnosis. In 51 cases there were 38 different physical diseases listed. In each of these cases there was a definitely important psychiatric problem,

which in many instances was of much greater significance from the standpoint of etiology and symptomatology than the physical pathology. Although a secondary diagnosis covering the emotional problems was usually made, the majority of these patients by necessity were referred to the family physician or referring agency

SCHEDULE A2.

SUBDIVISION OF CASES IN GROUP II ACCORDING TO SOMATIC DISEASE AND MENTAL REACTION TYPE.

GROUP 2A.

- | | |
|--------------------------------------------------------------------------|------------------------------------------------------------|
| 1. Myocardosis (neurasthenia). | 19. Polycythemia vera (reactive depression). |
| 2. Bartholin's Cyst—retroversion of uterus (conversion hysteria). | 20. Rheumatic heart disease (mental deficiency). |
| 3. Ostitis fibrosa cystica (conversion hysteria). | 21. Endometritis (hypochondriasis). |
| 4. Rheumatic heart disease (conversion hysteria). | 22. Pelvic inflammatory disease (anxiety hysteria). |
| 5. Chronic posterior urethritis (reactive depression). | 23. Pelvic inflammatory disease (reactive depression). |
| 6. Chronic arthritis deformans (neurasthenia). | 24. Prostatic hypertrophy (mild involutional melancholia). |
| 7. Menopausal syndrome (involutional neurosis). | 25. Upper abdominal mass (involutional neurosis). |
| 8. Pregnancy (mental deficiency). | 26. Chronic sinusitis (involutional neurosis). |
| 9. Cystitis (reactive depression). | 27. Chronic sinusitis (involutional neurosis). |
| 10. Pyelitis (reactive depression). | 28. Chronic tonsillitis (anxiety hysteria). |
| 11. Uterine bleeding—cystic cervix rectocele (psychopathic personality). | 29. Peri-duodenal adhesions (cyclothymia). |
| 12. Chronic cholecystitis (neurasthenia). | 30. Compressed fracture dorsal vertebrae (anxiety state). |
| 13. Chronic cholecystitis (involutional neurosis). | 31. Fractured femur (involutional psychosis). |
| 14. Chronic mastoiditis (conversion hysteria). | 32. Hodgkin's disease (psychopathic personality). |
| 15. Migraine (anxiety hysteria). | 33. Massive urticaria (anxiety hysteria). |
| 16. Hypothyroidism—obesity (reactive depression). | 34. Pulmonary emphysema (neurasthenia). |
| 17. Hypopituitarism (anxiety hysteria). | 35. Duodenal ulcer (psychopathic personality). |
| 18. Diabetes mellitus (conversion hysteria). | 36. Unexplained fever (anxiety hysteria). |

GROUP 2B.

- | | |
|-----------------------------------------------------------------------------|------------------------------------------------------------------|
| 37. Gastritis—hypertrophy of pylorus (anxiety hysteria). | 45. Visceroptosis (neurasthenia). |
| 38. Gastritis (neurasthenia). | 46. Chronic cholecystitis (anxiety hysteria). |
| 39. Gastritis (anxiety state). | 47. Secondary anemia (anxiety hysteria). |
| 40. Duodenal ulcer (anxiety state). | 48. Diabetes mellitus—mucous colitis (anxiety hysteria). |
| 41. Duodenal ulcer (anxiety state). | 49. Ulcerative colitis (anxiety hysteria). |
| 42. Duodenal ulcer (anxiety state). | 50. Ulcerative colitis (neurasthenia). |
| 43. Peri-duodenal adhesions—hepatitis (conversion hysteria). | 51. Hypertensive cardiovascular disease (involutional neurosis). |
| 44. Ptoxis of stomach—hemorrhoids (conversion hysteria, mental deficiency). | |

with insufficient stress on the emotional problems present. In a high percentage of these cases there was a very distinct psychosomatic relationship wherein the physical disease was clearly the outgrowth of the emotional disturbance, such as in several cases of colitis where the illness was maintained by virtue of the secondary gains entailed.

Group III consists of patients having no significant organic disease and usually showing clear-cut psychoneuroses. These are not so difficult to cope with from the diagnostic standpoint but again must be referred to the family doctor; and it is frequently found that unless the family physician is psychiatrically trained or interested in this type of case, he is apt to consider that the patient's problems are solely imaginary. Hence it is necessary to supply the family doctor with a long history, outlining the underlying mental mechanisms. This is not always feasible. First, it is frequently undesirable to record many intimate details revealed by patients in the hospital records which are often read by nurses,

SCHEDULE A3.

SUBDIVISION OF CASES IN GROUP III ACCORDING TO MENTAL REACTION TYPE.

I. Psychoneuroses	27
1. Hysteria (including anxiety hysteria, conversion hysteria and sub-groups)	16
2. Psychasthenia	1
3. Neurasthenia	4
4. Hypochondriasis	5
5. Reactive depression	1
II. Psychosis with mental deficiency	1
III. Schizophrenia	2
Total	30

medical students and others. Much of the material revealed to the psychiatrist is of a strictly confidential nature and patients not infrequently will discuss matters pertaining to their personal affairs with a physician in a distant city because they feel that the information is not likely to be made available to those with whom they come in daily contact. This has been found to be true even in some patients who seem to have complete confidence in the family doctor.

Properly to prepare a report to the family physician requires careful thought upon the part of the physician who compiles the data. In a large hospital this is frequently done by the historian in the record room or by one of the resident physicians. Since the time required of the psychiatric consultant to make the psychiatric examination is often lengthy, it is usually impractical for him to

dictate such reports. The solution may eventually be found in the development of residencies in psychiatry in the larger general hospitals, such as we now have at Jefferson Hospital, the resident being made responsible for the preparation of reports which should be approved by the chief of service and the attending psychiatrist.

Group IV does not greatly concern us here except as it indicates that certain patients who impress the attending physician or surgeon as exhibiting mental problems, may be found to be behaving in a reasonable fashion when the mental mechanism is evaluated by the psychiatrists. Frequently a patient is referred as a psychiatric problem whose reactions are properly proportionate to the physical illness, which has been clouded by the psychiatric symptoms to a misleading degree.

SCHEDULE A4.

PATIENTS IN GROUP IV SHOWING NO MENTAL CONDITION AND CLASSIFIED ACCORDING TO SOMATIC DISEASE.

Case No.	
1. BH 4467.....	Pelvic phlebitis.
2. CH 2860.....	Duodenal ulcer.
3. CH 1555.....	Delayed puberty.
4. BH 9341.....	Pneumoconiosis.
5. BH 8467.....	Multiple sclerosis.
6. BH 8967.....	Rectocele-chronic endocervicitis.
7. CH 2435.....	Renal failure.

To determine the average duration of hospitalization and the relative amount of laboratory work performed, these factors were investigated in the various groups as shown in Schedule B.

It has been assumed by some physicians that patients with vague complaints enter the general hospital and remain for prolonged periods undergoing numerous and repeated laboratory studies in order to elicit the cause of their difficulty. This assumption would not be borne out by this analysis. It will be noted that patients with organic disease productive of a severe mental state (Group I) had the longest period of hospitalization and the greatest number of laboratory procedures. This average was closely approximated by the patients in Group II, in which some physical condition was found. In Group III where the problem was fundamentally psychogenic, the period of hospitalization and number of laboratory

procedures was smallest. Most of these cases were being treated in the medical wards and figures would indicate that the internists are quick to recognize functional problems.

This is, to a certain extent, offset by the data recorded in Schedule C showing the number of previous hospitalizations and operations, the largest number of which were found per capita in the patients of Group III.

It might be stated, however, that emotional factors are now being given more consideration as indicated by the fact that the number of days elapsing between the date of admission and the psychiatric consultation was relatively small in Group III, where

SCHEDULE B.

SCHEDULE OF AVERAGE DURATION OF HOSPITALIZATION IN DAYS, NUMBER OF LABORATORY STUDIES (EXCEPT URINALYSES) AND ELAPSED DAYS BEFORE PSYCHIATRIC CONSULTATION.

Group.	Average duration of hospitalization in days.	Average number of laboratory studies (except urinalyses).	Average number of elapsed days before psychiatric consultation.
I.	22.2	11.6	5.0
II.	21.9	10.0	9.8
III.	14.0	7.9	6.2
IV.	20.0	10.0	10.6
Grand average	19.4	9.5	8.2

(See Schedule C regarding longer previous hospitalizations and operations in this group).

the most definite emotional disturbances were noted. This would tend to avoid expensive and numerous laboratory procedures and prolonged periods of hospitalization in this class of patients. The average duration of hospitalization for the group was even less than the general average (sixteen days) of all ward patients.

It is the opinion of some that it would be economically sound for any large general hospital to employ a full-time psychiatrist. Justification for this opinion would rest on the elimination of expensive studies and shortening of the period of hospitalization. Nevertheless it is important that every psychoneurotic patient have a thorough physical study as the basis for subsequent psychotherapy. The real value of the psychiatrist would rest upon his educative potentialities to both staff and patient.

It will be observed that of these 100 patients, 81 presented emotional problems of sufficient degree to warrant psychiatric study and treatment which, by necessity, had to be provided while the patient was being treated in one or another of the general wards, there being no separate psychiatric ward service. This arrangement presents certain disadvantages, previously detailed. However, care in the general hospital ward has certain advantages for the psy-

SCHEDULE C.

SCHEDULE OF PREVIOUS HOSPITALIZATIONS AND OPERATIONS ARRANGED BY GROUPS.

PREVIOUS HOSPITALIZATIONS.

Group No.	No. cases.	Same complaint, number of times.						Different complaint, number of times.						Total.	Per capita.
		1	2	3	4	5	Total.	1	2	3	4	5	Total.		
I.	12	1	1	..	..	..	3	1	..	..	..	..	1	4	.3
II.	51	14	6	3	3	1	52	9	2	..	..	..	13	65	1.3
III.	30	7	3	4	..	1	30	9	2	1	..	..	16	46	1.5
IV.	7	3	..	..	..	..	3	..	..	..	..	..	..	3	.4
Total 100		88						30						118	1.1

PREVIOUS OPERATIONS.

Group No.	No. cases.	Same complaint, number of times.						Different complaint, number of times.						Total.	Per capita.
		1	2	3	4	5	Total.	1	2	3	4	5	Total.		
I.	12	..	..	..	..	..	..	1	..	..	..	..	1	1	..
II.	51	6	1	3	..	1	22	9	2	..	..	..	13	35	.7
III.	30	3	1	2	..	..	11	7	1	1	..	..	12	23	.8
IV.	7	1	..	..	..	..	1	..	..	..	..	..	..	1	..
Total 100		34						26						60	.6

chiatric patient, regardless of the nature of the complaint. It tends to avoid segregation with the implication that an individual with an emotional problem is different from other sick people, and may thus gradually eliminate the stigma which is unfortunately still attached to mental disorder. Care in the general ward tends to impress the patient with the completeness of the study since the patient is seen by various consultants and aids in placing psychotherapy on a firm foundation since it removes the opportunity for

the patient to state that certain physical investigations have not been carried out. In the average general ward there is a certain camaraderie among the patients. The neurotic individual finds people who are really physically ill and suffering more acutely than himself. The atmosphere is more or less emotionally neutral. He is, for a temporary period at least, removed from the emotionally disturbing factors in the home; is temporarily relieved of responsibility and is waited upon rather than having demands made upon him. However, most of the patients return to their old environment and the psychiatric approach which has been started often cannot be continued. This difficulty can only be resolved when every physician in general practice has had a thorough foundation in psychosomatic medicine and psychiatry, and will follow the leads provided by the psychiatric consultant. In some locations patients can be referred by the family doctor to psychiatric clinics where a psychotherapeutic program can be continued.

This brings us to the problems of the out-patient psychiatric department. Here again the analysis of the type of patient is helpful. Among 100 consecutive new cases, it was found that 58 were suffering with psychoneurosis, 25 had psychosis of one form or another, 5 were psychopathic personalities or adolescent behavior problems, 2 exhibited no mental condition of significance. (Schedule D.)

Of these patients 70 were found suitable for psychotherapy; mental hospitalization was required in 7; 14 were seen in consultation only; 4 were not considered suitable for therapy; 1 was referred to a special child guidance clinic and 4 did not require psychiatric treatment. Of the group in which psychotherapy was indicated, several required only one or two interviews to solve relatively simple problems.

Most of the patients studied in the psychiatric clinic were referred from other hospital out-patient departments, some from the wards and a few from other sources; they were patients living within a reasonable distance from the hospital, and those whom the referring physician was willing to have continue psychiatric treatment in the out-patient department. Out-patient problems differ considerably from those met with in the ward. In the first place, many of these patients had attended many other out-patient departments, some having been registered as clinic patients for

years. A great many had been recognized as neurotic but were carried along from year to year with prescription renewals, re-investigations and the like. In many instances the neurosis had been thoroughly fixed on a physical basis and there was little possibility of a favorable response to psychotherapy or any other form

SCHEDULE D.

I. Psychoneuroses:	
1. Neurasthenia	17
2. Psychasthenia	3
3. Anxiety neurosis (including anxiety hysteria).....	13
4. Conversion hysteria	10
5. Reactive depression	6
6. Other types (psychic impotence).....	5
7. Mixed type	4
II. Psychoses:	
1. Schizophrenic reaction type.....	20
2. Affective reaction type	
Manic-depressive psychoses	1
Involuntal melancholia	1
3. Organic reaction types.....	2
4. Other types	1
5. Paranoid reaction type.....	1
III. Mental deficiency:	
Without psychosis	3
With psychosis	2
IV. Allied conditions:	
1. Psychopathic personality	1
2. Adolescent behavior problem.....	4
V. No mental condition.....	1
VI. Alcoholism	1
VII. Undiagnosed	5

100

Child Psychiatric Clinic:

51 new patients

225 re-visits

of psychiatric approach. It was deemed advisable to avoid accepting these patients for active treatment since to do so would handicap the care of patients on whom the psychiatrist's time could be spent to greater advantage. On the other hand, a large percentage of cases were younger individuals whose neurosis or other mental condition was of relatively short duration. These cases were

accepted for treatment and a program of psychiatric therapy carefully outlined.

It has been found expedient to conduct the clinic on a regular appointment basis, making appointments on the half-hour or hour schedule. The chief of clinic assigns each new patient to a physician, having regard to the type of problem presented by the patient and to the physician's personality and training. Such an arrangement permits the development of systematic psychiatric treatment. Unfortunately patients receiving treatment through the out-patient department must live in a home environment frequently rampant with emotional conflicts and often relatives are unsympathetic toward the aims and approach of the psychiatrist. The patient may meet with skepticism and ridicule from his family and friends, and is frequently pressed by financial stresses and responsibility. Some patients themselves object to attending a psychiatric clinic. The increasingly intimate liaison between the departments of medicine and psychiatry is helping to lessen this discomfort.

A problem in the general hospital which has only been mentioned casually is that of the time required by the psychiatrist and psychologist. In order to study adequately any psychiatric case at least one to two hours are required and often more. If psychiatric consultations are numerous, a tremendous burden is placed upon the consulting psychiatrist and may result in hurried, incomplete examinations which are often misleading rather than helpful. At present there is a dearth of trained psychiatrists available to staff the general hospitals. This is true even in large centers such as Philadelphia, and there is complete absence of psychiatrists in many centers of population throughout the country. The amount of private psychiatric work arising in most hospitals is usually not sufficient to justify a consulting staff large enough to cover the ward and clinic needs adequately.

SUMMARY.

Of a group of 100 cases seen in psychiatric consultation in the wards of a general hospital, only 12 per cent had mental conditions that could be considered the direct result of organic disease. Fifty-one per cent of the patients were found to have some organic pathology, but in the majority of these the psychic factor could

rightfully be considered predominant. Hence psychotherapy, or some form of psychiatric treatment, had to be considered a vital part of the therapeutic program. In another 30 per cent of patients no significant organic pathology was discovered, and in this group psychiatric treatment, in most instances psychotherapy, was the only appropriate form of treatment. These latter two groups taken together form 81 cases requiring some form of psychiatric help, not only while in the hospital but after discharge as well. Due to the great amount of time required to carry out an adequate psychotherapeutic program, the available personnel of the psychiatric departments of most general hospitals cannot be considered sufficient to cope with the problems presented by such a number of patients.

The matter of extramural care is obviously more difficult to handle. These patients must return to their home communities which in few instances provide any type of formal psychiatric help. The general practitioner who must look after the patients will usually be unable, due to lack of training or interest, to continue adequately the investigation and treatment of the emotional problems involved.

One thing which may not be readily recognized and hence not managed as skillfully as desirable, is that hospitalization itself is a powerful psychotherapeutic agent. It necessitates separation of the patient from his home environment, provides for a short period an emotionally neutral atmosphere and relieves him of burdensome duties, the value of which factors is often overlooked. Unfortunately this therapeutic aid is too often counter-balanced by the emotional influences incident to the personality of the hospital.

In reviewing the whole problem it would seem that there is a wealth of psychiatric material in every ward and clinic. Clinicians are becoming increasingly aware of the significance of psychiatric findings in their patients and are demanding ever-increasing service of the psychiatrist in the general hospital.

DISCUSSION.

DR. WILLIAM E. GARDNER (Louisville, Ky.).—The splendid paper of Doctors Keyes and Matthews calls our attention to the invaluable aid which can be given to patients with psychiatric symptoms in a general hospital, if a service is well organized along lines which have been suggested by the

authors. It is agreed at once that an out-patient department for this class of patients is practically indispensable, if a sustained program of adequate psychotherapy for a considerable number of the indigent or low income groups is contemplated.

In a large teaching hospital, it is important that sufficient trained personnel, including psychiatrists, clerks and psychiatric social workers, be assigned to such a service and that they be available for work a specified number of hours, two or three days per week. In a private general hospital of average size, less personnel with shorter periods of service will be required, but those assuming such responsibility in either should not take their duties lightly. There will be an inevitable accumulation of cases needing treatment over some length of time, and they should be restricted as much as possible to those which might fall within the classification of the so-called actual neuroses. Here we have in mind particularly anxiety neurosis, neurasthenia and hypochondria, as contrasted to classical types of hysteria and compulsion neurosis, which latter have unmistakable regressive tendencies and require more detailed and prolonged psychotherapeutic investigation. In the former, aside from the immediate or precipitating psychological factor, there is actual, even if temporary, physical disturbance within the organism. Such cases usually respond more favorably after a preliminary period of hospitalization in which there has been an adequate physical examination with appropriate laboratory studies.

I like the idea of a private consultation room on the medical ward of a general hospital, as suggested by the authors, to initiate a proper psychotherapeutic approach, preceding later follow-up treatment, either in the dispensary or the physician's private office. Aside from a relatively small percentage of major psychotic episodes which develop subsequent to acute physical illness or major surgical procedures, a large proportion of psychiatric problems occurring in a general hospital, even if associated with somatic disorders, are minor reactive types which are not of a serious or deeply rooted nature. These will sometimes yield quite readily to the intelligent and patient approach of the physician who has been trained in the observation of unusual personality responses. An interest in the subjective difficulties of the patient, an understanding attitude and the unprejudiced advice of a wise medical counselor will often clarify tremendously the symptoms arising from a complicated domestic, financial or social situation which may have existed for some time previous to the onset of symptoms which required hospitalization.

However, in the actual neuroses previously mentioned somewhat more deeply rooted internal conflicts are principally responsible for the symptom formation, but even these are not irreversible situations if carefully and tactfully investigated for a reasonable length of time. Of special interest to the internist, as well as the psychiatrist, is the conversion of psychic energy into various somatic channels where it gives rise to numerous symptoms simulating organic disease.

Furthermore, the dynamic mind-body relationship has been well understood by psychiatrists for a great many years, but only within more recent

years do we hear the intriguing designation of "psychosomatic relationships." The latter has had a very forceful and, I trust, wholesome appeal to our younger internists, surgeons and other medical specialists who work in general hospitals, most of whom have, especially within the past decade, obtained a working knowledge of the principles and practices of present day psychiatry (thanks to the Division on Psychiatric Education of the National Committee for Mental Hygiene). This is in keeping with the precepts of Dr. Keyes and Dr. Matthews when they urge that the family doctor be more completely trained in the handling of the neuroses, so that he can carry through a proper psychotherapeutic program similar to that which is done in a psychiatric clinic.

DR. W. W. YOUNG (Atlanta, Ga.).—It seems to me that the main difficulties in the treatment of psychiatric problems in a general hospital are two: first, the fact that service cases have many doctors and there is not that needed feeling of security which a patient gets from being attended by one individual; second, the patient is in a hospital where there is a multiplicity of disorders and where he sees patients wheeled to and from the operating room, an atmosphere of illness, so that in his impressionable state bad matters may become worse. Both these difficulties might be offset by having a psychopathic ward in the general hospital. Here cases more or less selective in character may be handled and still have the advantages of general hospital contacts.

The most important asset in the treatment of psychiatric cases in a general hospital is that the psychiatrist himself profits by contact with other specialties, to the patient's advantage. The experience of the general practitioner is very good for the psychiatrist, and that of the psychiatrist for the medical practitioner. Every general hospital should have a psychiatric service so that there may be a give and take between the various elements in the medical profession to the betterment of the practice of medicine and to the welfare of the patient.

DR. ROBERT A. MATTHEWS (Philadelphia).—Dr. Young's mention of the possibility of developing psychopathic wards in general hospitals is valuable. I think that in time we shall have a psychopathic department in most general hospitals but we probably will not be able to study and treat the types of patients referred to in our paper in such a ward. The referring doctor would probably not be willing and the patients, themselves, possibly should not be expected to enter a psychopathic department since in most instances they do not come in with a complaint problem that is sufficiently severe from a mental standpoint to justify admission to such a department.

When we say to the surgeon or the internist, "Yes, we believe this patient with colitis has his illness resting on an emotional basis," the surgeon or the internist may reply, "Now what are you going to do about it? He has had colitis for several years. You cure him." We are at times in such cases as unsuccessful as the internist has been, so we should be careful not to oversell what can be done from the psychotherapeutic standpoint. On the

other hand, we have the right at least to explain to the physician in the hospital the emotional aspect of all these cases.

There are several points that I think ought to be discussed in a little more detail. In the first place, these patients are admitted to various services. The psychiatrist sees the patient primarily as a consultant, and even in those patients (constituting 30% of our group) whose primary problem was a psychogenic one and who have a psychoneurosis, the psychiatrist does not become the physician actually in charge of the case. He remains a consultant and it is difficult for him to direct therapy completely, even while the patient is in the hospital. It requires a better arrangement than we have been able to effect up to the present.

In the patient who enters the hospital believing himself physically ill, it requires time and tact to help him see that his illness may rest on an emotional basis. Although admission to a psychopathic ward would place that type of case under the full direction of the psychiatrist, it might not be readily accepted by the patient.

The admission of patients to the general hospital for a period of study is probably not utilized as much as it should be. Even if nothing is found to be physically wrong with the patient, that period of study in the hospital often marks the beginning of improvement by establishing a basis for subsequent therapy and providing a change in the emotional environment even though temporary.

I would like to stress again this matter of the duration of hospitalization. It is commonly thought that the psychoneurotic patient comes into the hospital and remains a long time, but we found that those patients who had an uncomplicated psychoneurosis had the shortest period of hospitalization of the entire group.

A REVIEW OF THE CONCEPT OF INSANITY.*

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The rapid strides made by psychiatry in the past few decades and the permeation of the psychiatric attitude into other fields have been noteworthy developments. It is difficult to reconcile these advances with the comparatively slight changes in the general social, and legal attitudes towards the mentally ill. One of the outstanding anachronisms is the continued use of the concept of "insanity" for commitment and other legal procedures.

Although there is a general repugnance and vagueness about the use of the term "insanity," it continues in the statutes of most of the states and is apparently looked upon as a definite entity. Certainly physicians are called upon daily to testify to the existence of such a condition before patients are admitted to hospitals for treatment or judgment passed in certain legal procedures. To dismiss insanity as a legal concept, as William A. White,¹ Zilboorg² and other psychiatrists have done, brings about a rebuke from legal authorities. In 1911 a committee of the American Bar Association published a report on this question in which it is stated: "As criminal responsibility is a purely legal question, so insanity is a medical one which must be answered by the physician."³ This has never been revised.

In this introductory paper the writer proposes to discuss the development of the concept of "insanity" from historical, social, legal and psychiatric points of view, and to bring up for consideration some of the factors that help to account for the backwardness of social and legal attitudes towards the mentally ill.

The term "insanity" condensed from "insanity of mind" came into popular usage in England in the 17th century. It gradually replaced such terms as "madness," "lunacy," "imbecility," etc., in medical and legal writings. "Insanity" covered all forms of mental disturbance other than those due to outstanding congenital defect

* Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

and was considered to be a definite medical entity by 19th century psychiatrists. For example, the definition of Dr. Isaac Ray: "Insanity is a disease of the brain inducing a prolonged departure from those modes of thought and states of feeling natural to the individual in health."⁴

Late in the 19th century the term "psychosis," meaning at that time the abnormal mental condition that accompanied an underlying disturbance in the neurones or "neurosis,"⁵ came into the medical literature, and in the 20th century began to replace "insanity" as a medical or psychiatric entity. This made for a great deal of confusion as the term "insanity" continued to have a popular meaning and usage. Thus in a courtroom, when judge, medical experts and the jury talk about "insanity," they all mean very different things. To the judge it is a question of legal responsibility, to the physician of the presence of a psychosis, and to the jury, as we shall see, of the social responsibility of the individual.

Even the most primitive groups considered mental disorders as a thing apart from physical illness, and developed customs for the handling of such conditions.⁹ This, of course, is an expression of the belief in the dichotomy of body and soul which is still widely in existence. In early times the recognition of insanity was based primarily on the conduct of the individual. For example, the description given by the ancient Hebrews: "He who walks out alone at night, or spends the night in a cemetery, or tears his garments, or destroys what is given to him."¹⁰

Anti-social behavior especially attracted attention because this would involve the social responsibility of the individual. The concept of social responsibility, as formulated by Saleilles¹³ in 1898, indicates that society assumes the normal individual to be capable of taking personal responsibility for his conduct, and it expects him to respond to the ordinary motives of daily life in a manner which he is capable of understanding as normal. The conduct and motives of the insane, being outside the limits of normal social expectation, such individuals could not be considered responsible socially and hence would lose their social status. Maudsley, writing about the general attitude towards the mentally ill, recognized this loss of status by the insane: "It is plain that he has fallen from man's high estate, that he is no longer one with his kind . . . and that he is something of a reproach to the nature of humanity."⁶

Marked aberrational behavior, which would include "raving," was the generally accepted criterion for "insanity" until the beginning of the 19th century. At this time Europe was emerging from the darkness of the Middle Ages, and psychiatry, which had been a branch of medicine since the time of Hippocrates, began to undergo a renaissance. The development of the science of psychology attracted attention to disturbances in thought processes. This was reflected in the dictum laid down by Hill in 1814 that a breakdown in the "logical association of ideas" and "erroneous judgment" were the diagnostic criteria of insanity.¹⁴ Rush, in the United States, felt that disorders of "perceptions, judgments and reasonings" were the principal manifestations of insanity.¹⁵

Many new descriptive advances were made. Pinel in France introduced the controversial concept of "*manie sans délire*," or insanity characterized by an emotional or affective disturbance without any involvement of intellectual functioning. Pritchard in England introduced the concept of "moral insanity" to include cases that showed marked deviations in the sphere of character development without any pronounced intellectual or affective disturbance.¹⁶ In addition to these and the many other descriptive and classificatory advances that came later in the century, the work of the biologists (Lamarck and Darwin), of the philosophers (Schopenhauer and Spencer), and of the French neurological school (Charcot, Janet, Babinski, etc.) paved the way for a new and dynamic psychopathology. How much these contributions influenced the development of psychiatry was expressed by Mercier in 1890: "To explain the whole of insanity requires a knowledge of neurology, psychology and sociology."¹⁸

The newly introduced principles of determinism, running counter to the popularly held concepts of responsibility and freedom of will, provoked a storm of protest from theological, lay and legal sources. Psychiatry was accused of attempting to break down the defenses of society against anti-social behavior by making apologies for many who would not come under the popular conception of insanity. Such accusations were made by many legal authorities,¹⁹ and increasing difficulties arose because of the differences in psychiatric and legal interpretations. The legal attitude can be taken as a reflection of social attitudes as the latter are considered to form the basis of statutory law.

From the aspect of legal responsibility, mental disturbances have been grouped into four categories according to the practical issues at stake: (1) when used as a defense in criminal action; (2) where the validity of legal testament is involved; (3) for legal guardianship and (4) for commitment to a mental hospital. Although "insanity" covers all of these categories in legal procedures they are not mutually inclusive.

Statutory law took recognition of the condition of insanity at least as far back as the days of Solon in ancient Greece. In Rome the insane were stripped of their civil rights and responsibilities.¹¹ In England it was not until the beginning of the 14th century that official recognition was given to insanity as a defense in criminal cases.²⁰ Based on the concept of punishment as a deterrent for crime and the doctrine of free will (an outgrowth of western philosophy), it was felt that it would be inhuman and useless to punish an individual who was not a free agent. This attitude is still basic in our legal structures today.

In the 19th century the protest of social and legal authorities to the newly introduced medical concepts, as they affected procedure in criminal cases, was manifested in the investigation of the House of Lords into the unpopular decision in the famous McNaghten case of 1843.⁷ McNaghten, according to social standards, was responsible for his actions, and yet he was ruled to be "insane" on medical testimony. The chief justices of England were asked for a ruling on insanity as a defense in criminal law and authoritative rules covering legal responsibility were drawn up. These rules are still in use today as the familiar "right and wrong" test of criminal responsibility. The law has always striven to be objective and scientific, but the definitions laid down in this ruling are acknowledged to be ambiguous, moralistic and difficult to apply.

From a practical point of view, in almost all instances the issue of insanity in criminal cases is decided by the jury according to the popular attitude towards the crime, the criminal and the setting of the trial.²¹ The position of the medical expert is extremely vulnerable because of fixed legal procedures, and expert medical testimony is easily disparaged if it does not agree with the popular verdict.

The divergence between social-legal and medical attitudes is also well exemplified in our commitment procedures. In the 19th cen-

tury as society became increasingly suspicious of medical authority over the mentally ill, elaborate legal precautions were built up against the possible abuse of this authority. In England there was very little legislative action to protect the insane or to procure care and treatment for them until 1774.²³ However, by the middle of the 19th century laws regulating commitments were well developed, and in essence have not changed very much since then. How much they encroached on the authority of the medical profession in England can be judged by the rather caustic advice given by Dr. Sheppard in 1873: "Insanity is a very serious issue. . . . To take away a man's liberty upon the plea of insanity without complying with all the legal requirements, may be the cause of your being dragged through all the courts in the kingdom."¹⁷

A survey of the commitment laws of the United States, England, France and Germany in 1883²⁴ shows close similarities in the basic procedures with only minor cultural variations. In the United States, just as the country was stirred up by Dorothea Dix in the 1840's and 50's about the facilities for the care of the mentally ill,²⁵ so it was stirred up in the 1870's about commitment procedures by Mrs. E. P. W. Packard.²⁶ Popular pressure demanded the formation of "lunacy commissions" with lay representatives to check on the activities of the medical profession because of the fear that sane people were being railroaded and the insane improperly cared for.²⁷ A wave of statutes demanding jury trial before commitment swept the country.

To a great extent, but somewhat irregularly, this has simmered down. Mandatory jury trials have been retained in only two states, Mississippi and Texas, and the trend is towards the adoption of provisions for voluntary admission (now in 34 states), and for some form of temporary or emergency admission without court order (now in 18 states). However, after summarizing the commitment laws in the United States in 1939, Grover Kempf²⁹ makes the following observation: "Even the best of the present laws hark back to the old conceptions of insanity, and Pennsylvania is the only state with the distinction of having placed its special laws on the high plane of illness and treatment."³⁰

As admitting officer at the psychiatric clinic of the New Haven Hospital, the writer was repeatedly impressed by the difference

between lay and psychiatric attitudes towards the mentally ill. In an attempt to understand this the writer recorded and followed through many statements made by patients, their relatives, friends, referring physicians and legal advisers.

The most common observation was the resistance to the acceptance of the patient as being mentally ill unless there was very marked aberrational behavior. It would seem that almost every individual feels competent to judge behavior on the basis of his own life experience. This judgment can only be made through the process of identification with the patient, and this mechanism of identification appears to play an important role in the cultural and emotional attitudes towards the mentally ill. Attempts are made by informants to minimize and explain the patient's difficulties in terms of situational stresses and strains, and one frequently encounters the anomaly of having the diagnosis admitted but then explained away.

On the cultural side there was frequently mentioned the threat to the social status of the patient and his family because of the stigma of "insanity." One of the most frequent of the criteria used to refute the psychiatric diagnosis was the belief in an almost instinctive fear engendered by the insane. A strong feeling of hostility towards the patient was often encountered especially when the symptoms were attributed to a lack of self-control, wilfulness, disregard for the feelings of others or failure to respond to the good services of the informants.

On many occasions considerable anxiety was noted in the informants. This could be interpreted as being due to the coming to the surface of some insecurity about their own mental status. This source of anxiety seems to have a broad background. Primitive people developed elaborate rituals to safeguard individuals and tribes from the evil spirits that might influence the soul or spirit life of man. In lay writings we see such expressions as "All men are liable to insanity without premonition."²⁵ Medical recognition of this anxiety was afforded by Maudsley: "Most persons who have suffered from the malady of thought must at one period or other of their lives have had a feeling that it would not be a hard matter to become insane, that in fact something of an effort was required to preserve their sanity."⁸ In the writer's group of informants, this anxiety was often expressed in the objection to state

hospitals, *e. g.*, "I would go insane if I were locked up in a place like that."

A fear of becoming "insane" was frequently encountered in patients. Many of them did not express this fear until good rapport had been established. None felt that they were "insane" although many had to be committed to insure treatment. The writer mentions this because of a frequently encountered belief that if a person expresses a fear of becoming insane, he never will. These patients all felt that they had to exercise considerable control to maintain their integrity, and sought assistance to strengthen this control.

People, throughout the ages, and also cross-sectionally in our own time, undoubtedly have different beliefs concerning the nature of insanity. Historically, the status of a mentally ill individual can be thought of as going through three rather broad stages: (1) where he is considered to be below the level of humanity, or the "wild beast" stage; (2) where he is considered as a social outcast, unpredictable, anti-social and with no more intelligence or judgment than a child; and (3) where he is considered to be a sick person with rights and privileges.

It has been said repeatedly that the attitude of the community towards mental disorders is a "true indication of the degree of real civilization attained by that community."¹² Unfortunately our civilization has not advanced sufficiently for the third stage to have a very wide acceptance, outside the field of psychiatry.

For generations psychiatrists and humanitarians have been asking the seemingly rhetorical question, "Why should mentally ill patients be treated as criminals?" We still see that authority for commitment to a mental hospital is vested in the courts, and transportation to mental institutions is too often the duty of the police. Dr. Overholser has pointed out that many of the state hospitals are under the jurisdiction of the State Departments of Welfare and that none is under the State Health Departments.³¹ The delinquent insane came under state care long before aid was extended to the dependent mentally ill,³² and still receive preference.

The answer appears to lie in the cultural and emotional factors that have been outlined above. When one considers the social and legal consequences that have always attended the recognition of "insanity," there is a close parallel to the attitude towards the

criminal as described by Alexander and Staub.³³ The factor of the control of one's emotions seems to have a high social value, and is frequently mentioned by both patients and informants. To see others fail to exercise control over anti-social activities brings about a sense of injustice, through the process of identification, because it strikes at the voluntary or involuntary repressions we all must make in society. This is as true for the mentally ill as it is for the criminal, and helps to account for the hostile attitude so frequently encountered towards both.

Because of the cultural and emotional factors underlying the general attitude towards the mentally ill, it seems unlikely that the stigma of insanity will ever be entirely eradicated. However, it can be minimized. The mental hygiene movement, over the past thirty years, has done a great deal in making society more conscious of the problems of the mentally ill and has shown the value of the application of the principles of psychological determinism, especially in the field of child guidance.

In the medico-legal field considerable progress is being made. The commitment laws and procedures in many of the states are gradually undergoing a change with the introduction of measures for nonjudicial methods of admission to mental hospitals. Attempts are being made to bring terminology up to date. In the field of criminal law Weihofen has indicated that the present trend is towards a revision of the procedures for determining the mental condition, past and present, of the defendant. "The part of our system of criminal procedure which stands in greatest need of reforms is the mode in which medical evidence as to the accused person's mental state is obtained. . . . Probably no other part of the criminal law governing the defense of insanity has been so severely criticized as the rules governing expert testimony."²²

Criminology and psychiatry are moving closer together. That psychiatry is prepared to make its contribution is evidenced by the recently published "Pennsylvania Plan."³⁴ This provides for intramural training in legal psychiatry which will help to bridge the gap between law and medicine for the mutual progress of both.

Less than a century ago, through the efforts of outstanding psychiatrists and laymen, the administrative distinction between acute and chronic, harmful and innocuous forms of insanity was overcome, and all patients were admitted to the same institutions. This

certainly was much preferable to having patients in workhouses and jails. However, because of the cultural and emotional attitudes about mental illness many patients did not reach these hospitals until their illnesses were far advanced. To meet this problem Dr. Frederick Peterson³⁵ of New York in 1899 proposed the establishment of psychopathic hospitals, psychiatric clinics and dispensary facilities for early and borderline cases, and he predicted the usefulness of such facilities as buffers between society and the state mental hospitals. A survey of Connecticut by Dr. Samuel W. Hamilton³⁶ in 1928-29 also indicated such a need, and the subsequent development and growth of the psychiatric inpatient and outpatient clinics in New Haven have proven the value of the buffer system.

There is a definite trend for state hospitals to widen their sphere of activities with the setting up of outpatient services.³⁷ This should go far in altering the prejudices against state hospitals as this type of activity again provides a buffer. With the realization that these prejudices are deep-seated and not subject to change through ordinary educational channels, a great deal can be done to make the existing psychiatric facilities more acceptable and useful for the individual and the community.

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DISCUSSION.

DR. WINFRED OVERHOLSER (Washington, D. C.).—Dr. Warson has devoted a great deal of study to the development of attitude toward the mentally ill in mental institutions. He tells me this is only the beginning of a number of papers, and I look for further very interesting contributions. It is helpful to us to understand how attitudes are developed, and we realize these attitudes have very practical aspects, not only in our care of the mentally ill but how the mentally ill look upon themselves as well as being looked upon.

There were many topics raised by Dr. Warson which should call for elaborate and scientific discussion but time does not permit. It is well to remember that the McNaghten rule Dr. Warson speaks of, and which was laid down almost one hundred years ago, was not really a decision on a case. The judges of England were asked some abstract questions by the House of Lords. Of course they had in mind McNaghten, but there was not an argument before them as to evidence and the questions were entirely hypothetical. It is interesting to note that that rule was really a step backward away from an attitude of leniency and consideration of mentally disordered defendants. It tightened up very much on a trend which had been until that time in favor of the mentally ill person accused of an offense. It is astonishing how since that time it has stuck.

The law apparently does not recognize that there has been progress in psychiatry in the last one hundred years, with the exception of so-called irresistible impulse doctrine which was developed in this country largely, as Dean Pound told us once in an annual address before this Association, as a method by which a jury might let off an offender who was guilty of the act but with whom the community sympathized.

As for the jury being the final judge and sometimes disregarding the facts in favor of their emotions, there is an interesting case that came up rather recently in the State of Colorado. In Colorado it is provided that if a defendant pleads insanity, he must be committed to the state mental hospital for observation. A very low-grade feeble-minded boy was so committed and the report of the physicians from the state hospital was unequivocal to the effect that he met all the criteria of mental unsoundness. Nevertheless, the jury chose to believe one or two police officers who said in their opinion he was sane and they not only convicted the poor imbecile but he was actually allowed to go to the lethal chamber.

Dr. Warson points out another and urgent reason for the development of community clinics, namely, the fact that they are an extremely effective means of breaking down in the minds of the public the prejudices against which we as hospital people and as persons dealing with the mentally ill have to struggle.

DR. GROVER A. KEMPF (Washington, D. C.).—Dr. Warson's paper has been extremely interesting to me because I have devoted some time to the study of commitment laws throughout the United States.

I believe that it is not within the power of the human mind to define insanity, and so far as commitment is concerned, that we should regard the person solely, not to determine whether he is sane or insane, but whether his condition is such as to warrant his placement in a special hospital for treatment and care.

In commitment we need some form, as the lawyers call it, of due process of law to hold a person against his desire, but we can delegate that authority to a commission which need not include a court of law. We have an example of that in the State of Delaware where the patient is sent to the institute for observation, and if he needs commitment, the board of trustees can act as a commission with judicial authority. Such a commission, whether it consists of psychiatrists or psychiatrists and an attorney, can fulfill all the requirements of the Bill of Rights without any public trial or inquisition. Of course, the right of appeal for a rehearing is always open under the Constitution, but this is rarely resorted to.

Improvements in commitment laws are extremely difficult to achieve and yet in one state the legal profession actually submitted a bill to the State Legislature to put commitment on a broad and really medical basis.

I hope that Dr. Warson's paper will above all stimulate more interest among psychiatrists to secure better facilities for admission, commitment and early treatment.

DR. LOWELL S. SELLING (Detroit, Mich.).—I have become more and more convinced that the attitude of antagonism toward commitment to a mental hospital can be changed. In 1929 at Bellevue Hospital, as a result of a concerted effort for a period of two months, we had innumerable admissions on a voluntary basis. The relatives signed the application and we had to serve no one for the purpose of commitment.

In the court clinic dealing with misdemeanants who go to a civil rather than a criminal mental hospital, one can always offer the alternative of a jail sentence or a criminal mental hospital and the relative takes the choice of a less drastic procedure and is willing to sign the petition.

As to the changing of court or legislative attitudes toward insanity, that also can be handled without legislation. After all, to change the laws is quite a process, particularly in forty-eight states and the Federal Government. I think the attitude toward the insanity act is largely governed by the attitude of the judiciary.

In our court, after twenty years' experience we have almost no trials where the issue is insanity at the time of committing the crime. The Michigan law provides that a man is insane at the time of trial, if he is unable to understand the nature of the proceedings being brought against him or is unable to cooperate with counsel in a rational manner in his own defense. In other words, if you can't get the man to cooperate with counsel because of mental illness he should be hospitalized.

DR. GEORGE S. SPRAGUE (White Plains, N. Y.).—When we are talking about the concept of insanity, we must always consider the matter of the stigma attached. Stigma implies disapproval and to this question there are two angles. In the first place, the patient himself who says that he is afraid he will go insane, when questioned more deeply about it quite regularly states that to him to go insane means giving way, doing the thing which he will disapprove of doing.

From the social angle, society says that the man who goes insane is likely to do the thing of which society disapproves. This brings us to the dictum that William A. White gave us in his book, "Crime and the Criminal," according to which if we can understand the action of the patient we give him our sympathy, our toleration, and say that he is sick, and if we can't understand it, we feel more punitive.

Whether we see an organic illness in the patient is one of the factors in this question of stigma, because when we find, for instance a brain tumor, the public generally as well as the psychiatrist is apt to regard the patient with more tolerance and there is less stigma.

DR. SAMUEL R. WARSON (New Haven, Conn.).—If I were to state the theme of my paper it would be that the stigma of insanity is something that belongs to the present as well as the past, and if there is any change in the stigma or disapproval, it is purely quantitative and not qualitative.

Some of my friends in state hospitals have told me that I have been looking at this thing from a rather old point of view and that today we don't have the type of reaction to state hospitals that existed years ago. In reply I would like to quote something that I read in a book that was published in 1843:

"Happily the prejudices which have so long tended to thwart all discussion of the subject of insanity are rapidly yielding before calm research and dispassionate inquiry. No longer is the lunatic approached with the former forebodings of fear and dread nor the asylum looked upon as a bazar house or prison."

That is just about what we meet today. We have to admit in our own clinic any number of patients who are not particularly treatment problems, simply because their family refuses flatly to send them to a state hospital. During the time the patient is with us, we spend most of our time with the family trying to alter their attitude, sometimes with success.

THE INFLUENCE OF VISUAL AND AUDITORY STIMULI ON THE ELECTROENCEPHALO- GRAPHIC TRACING OF PETIT MAL.*

By ROBERT S. SCHWAB, M. D.

The electroencephalogram, since its introduction by Hans Berger¹ in 1929 has provided a certain quantitative method of measuring both duration and intensity of various forms of epileptic seizures. The work of Gibbs,² Kornmueller,³ Jasper,⁴ and others in identifying these epileptic patterns has shown particularly the sharply marked beginning and ending of these spells.

Lennox has observed that some patients continue counting or singing during the presence of petit mal waves (wave spikes). Clinically, however, confusion or lack of response is often associated with such attacks. The author, in a preliminary report,⁵ showed that a visual stimulus (an incandescent light of sufficient brightness to startle a person in a dark room, 150 watt tungsten nitrogen bulb) failed to provoke a response during certain petit mal attacks. The turning on of the light depressed a signal pen, thus registering on the brain-wave record as it came from the ink-writing oscillograph. The patient's response was registered by squeezing a bulb which broke by means of a tambour the circuit, closed by the light, allowing the signal pen to return to its original position. The distance between the two marks (the paper speed being constantly 3 cm. per second from a synchronous motor) is the reaction time to this stimulus. A group of normals showed that this interval is between .200 to .350 second, with a remarkable agreement in a series of observations.

During petit mal attacks this reaction time was always prolonged, and in severe and long attacks no response was noted. The re-

*Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

From the Department of Neurology of the Harvard Medical School and the Electroencephalographic Laboratory of the Massachusetts General Hospital, Boston, Massachusetts.

action time, therefore, gave a good indication as to the level of consciousness during the seizure. In cases where no response occurred unconsciousness may be presumed for the short interval under discussion (3 to 20 seconds). In such cases the patient usually stated afterwards that he did not see the light.

Further work with this type of stimulus brought out an objection. The accuracy of the reaction time depended on the patient's seeing the light at the instant the light switch was closed, or at a constant interval of time afterwards. From the General Electric Works at Nela Park in Cleveland, Dr. Forsythe⁶ supplied the time constants of the Mazda lights used. These required nearly .2 of a second to reach 90 per cent brilliance. The alert, awake, normal individual would see the light at 10 per cent brilliance which takes .05 second to build up. But individuals vary in accuracy and alertness, and epileptics are not normal people. There is no way of knowing, with such a light, to what degree of brilliance different persons are reacting and thus a large and variable error is introduced.

It was decided, after correspondence with the General Electric Company, to substitute a bright Neon light made in the shape of a horse shoe, running on 7,000 volts alternating current from a shielded transformer and cables, all *outside* the screened room, so that it did not interfere with the electroencephalogram. There is no delay, after the voltage is applied, in such a light reaching full brilliance (speed of electric waves). Actually, a Neon light running on 60 cycle alternating current is going on and off 120 times a second. The maximum delay has been calculated to be only .005 of a second which is well below the accuracy of this type of physiological measurement (Fig. 1). The low voltage 110 alternating current in the primary of the transformer went through one pole of a double knife switch and the signal circuit through the other pole. A silent mercury switch was used so that noise was excluded as a stimulus. With this stimulus, which was bright enough to be seen clearly through closed eyes in the darkened room, the absolute visual reaction time was easy to obtain. This was found to be from 0.180 to 0.250 second in normal people.

In addition to the Neon light stimulus, an auditory stimulus was set up. This consisted of a small "tug boat whistle" attached through a reducing valve to the compressed air line of the hospital

(70 lbs.). It was set up 100 cm. from the patient's head and activated by a whistle cord running into the recording room. When the whistle was blown, a mercury contact on the cord closed, thus registering the signal on the moving tape in the same manner as did the Neon light. The patient's response to the whistle was recorded in the same manner as that to the light (bulb and

DIFFERENCE IN TIME CONSTANTS OF 150 WATT LAMP AND NEON LIGHT

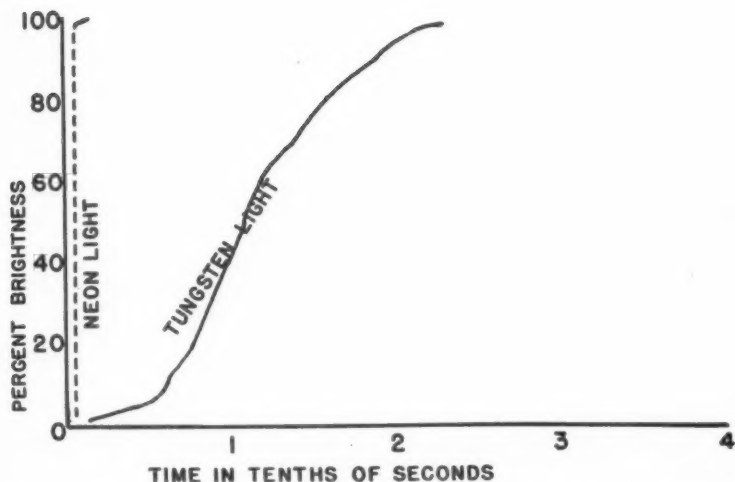


FIG. 1.—The time constants of a 150-watt incandescent tungsten lamp compared to that of a Neon light of equal brilliance.

tambour). In this manner either stimulus could be used at will during the appearance of abnormal waves in the electroencephalogram (Fig. 2). Furthermore, the intensity of the whistle could be increased by the reducing valve to any level tolerable in a hospital building.

Delay in the whistle system, due to the speed of sound in air from the whistle to ear and inertia of the whistle itself, were determined by a microphone on one brain-wave channel and each

found to be 0.0035 second. This error was always the same—0.0070 which was subtracted from all sound stimuli. The delay of the mechanical part of reaction time system (conduction of impulse along air lines to tambour and for mechanical delay in the tambour itself) were determined and found to be 0.012 of a second. This constant error was subtracted from all determinations. The reaction time to the whistle, correct for all of the physical constants, was from 0.160 to 0.225 second in a series of some 50 or more normal controls.

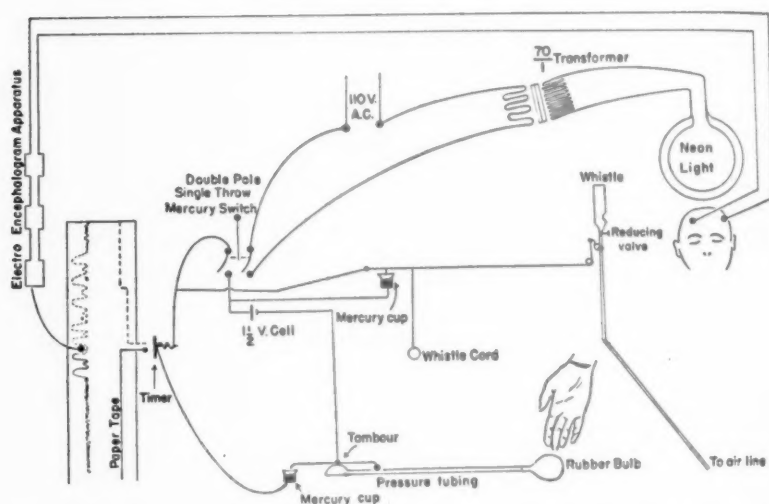


FIG. 2.—Diagrammatic plan of the light and whistle reaction time apparatus attached to the electroencephalographic machine.

THE EFFECT OF THE NEON LIGHT STIMULUS AND WHISTLE STIMULUS ON THE NORMAL ELECTROENCEPHALOGRAM.

Berger, Jasper, and others have shown that light or opening the eyes interrupts the normal 10-cycle alpha rhythm. Durup and Fessard⁷ have published data showing that, as the intensity of the light decreases, the time of alpha disappearance increases, varying from 0.168 to 0.357 second in their experiments. They used an incandescent lamp and reduced the intensity by placing increasing densities of opaque glass between the lamp and the

subject. Their data, when plotted, suggest the time constant values of an incandescent light (Fig. 1). In short, they were really measuring a filament curve by means of a human brain instead of a cathode ray oscillograph. To avoid this error, the Neon light was substituted in all of our later experiments, as previously mentioned. We found a constant alpha disappearance time with various light intensities in the same individual during the same experiment. The intensity of the light was reduced by means of a variable transformer in the primary circuit of the Neon light. The

TABLE I.

THE EFFECT OF THE REDUCTION OF LIGHT INTENSITY ON THE ALPHA DISAPPEARANCE TIME.

Light intensity.	Experiment A, second.	Experiment B, second.
Full brilliance	0.166	0.190
One-half	0.170	0.185
One-third	0.160	0.170
One-fourth	0.170	0.180
One-tenth	0.000	0.000

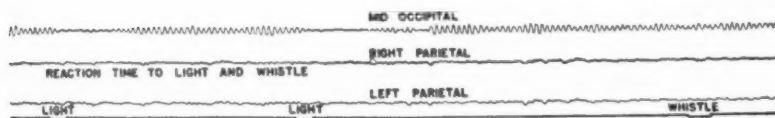


FIG. 3.—Reaction time and alpha wave disappearance to light and whistle compared.

intensity of the Neon light used follows closely the voltage indicated on the variable transformer.* Two examples of these observations are shown in the following table. It is seen that the relationship of Durup and Fessard is not true and that the "all or none" law (Bowditch's Law) holds good here.

The whistle stimulus fails in many cases to break up the alpha waves (see Fig. 3), but it slightly depresses them. In other individuals, sound is just as effective as the light in stopping the alpha rhythm.

* The intensity of the Neon light was measured with a Weston light meter, and at full brilliance (110 volts) gave a reading at 16" of .64. At half brilliance (55 volts) the reading was 3.2 etc.

THE EFFECT OF THE NEON LIGHT STIMULUS IN PETIT MAL ATTACKS.

The author confirmed the first series of observations with the incandescent lamp; namely, that the reaction time during petit mal cases was prolonged (Fig. 4), and often absent. It seems that if

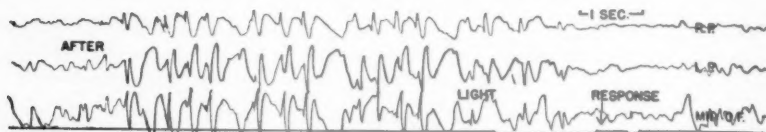


FIG. 4.—Prolonged reaction time to a Neon light stimulus in a petit mal attack.

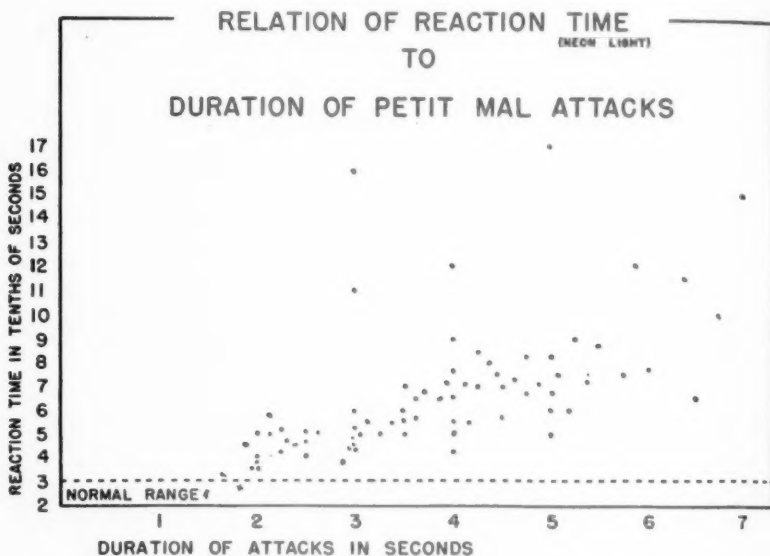


FIG. 5.—Relation of the Neon light reaction time to duration of attack in petit mal.

the attack was under 5 seconds, the reaction time was increased to 0.4 to 0.5 from the normal 0.2 and 0.30. If the attack lasted 5 seconds to 15 seconds the reaction time was 0.5 to 1.0 second. If the attack was over 20 seconds, no response occurred and unconsciousness is presumed. Fig. 5 shows a graphic relationship of the reaction

time to the duration of the petit mal attack in 78 observations. It is seen that a linear relationship exists with increasing impairment of the reaction time with longer attacks. In attacks longer than 8 seconds, usually no response to the light occurs until the attack terminates. In a few such long attacks it may be possible to get a response at the very end of the spell, suggesting that the return of consciousness is not instantaneous but gradually emerges over a period of 2-3 seconds. It is to be noted that the duration of the attack has more to do with the degree of impaired or lost consciousness than the actual voltage of each wave and spike.

In patients on whom such anticonvulsants as phenobarbital or sodium diphenyl hydantoinate are used with clinical success (reduction in number and intensity of clinically observed attacks), there may be a reduction in duration of the electroencephalographic spell, and often but not always a coincident shortening of the delayed reaction time. Therefore, the reaction time measurement may be of some value in estimating therapeutic success in petit mal epilepsy.

THE EFFECT OF LIGHT AND SOUND STIMULI ON SHORTENING THE PETIT MAL ATTACK.

It was observed early in using the reaction time set-up with the electroencephalogram, that if the patient responded to a stimulus, this occurred at the end of some attacks. At first it was felt that this was a coincidence, but it has happened so often that the effect can be regarded as a terminating influence. For example, one patient had, during a run without the light stimuli being used, 7 petit mal attacks which ran from 5 to 8 seconds. When the light stimulus was used in the middle of the spells, their duration was reduced to 3 to 5 seconds; all terminating at the stimulus and all showing response (Fig. 6). This strongly suggests a breaking through of the light stimulus. It was found that it was usual for 6-7 second attacks to be reduced by light to 3-5 second ones, whereas attacks of from 10-20 seconds were never so affected. In them the light stimulus was not answered, even if tried several times. These patients were unaware of the light and can be called unconscious (Fig. 7). With the whistle stimulus, it was found that the sound terminated attacks much more often than the light,

particularly if the sound was loud enough to be objectionable to the observer in the room with the patient (technician). Here, attacks of 10 to 20 seconds that failed to be broken by the light and were not answered by the patient, terminated abruptly with

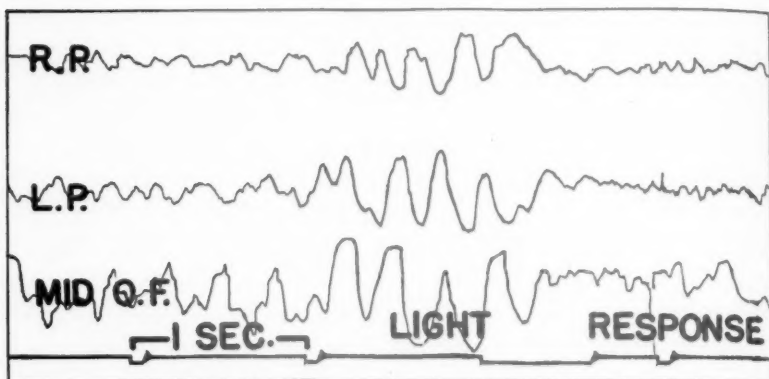


FIG. 6.—Shortening of a petit mal attack due to Neon light stimulus.

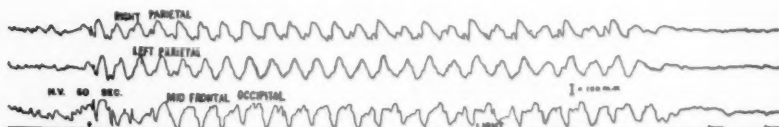


FIG. 7.—Absence of response to a Neon light stimulus during a petit mal seizure.

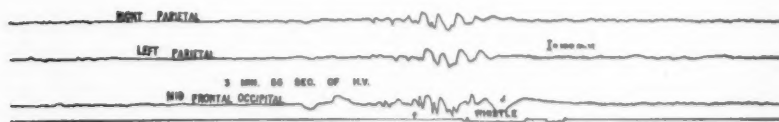


FIG. 8.—Shortening of petit mal attack due to a whistle stimulus.
(Same record as in Fig. 7.)

the whistle, but with a delayed response to this signal (Fig. 8). In very severe petit mal or grand mal the whistle failed to bring a response or break up the attack. Even when blown loudly for six full seconds (observer felt deafened by it), no response or impression on the waves was observed (Fig. 9).

There seem to be from these data six degrees of petit mal seizures:

- (a) Very short (1-3 seconds) with nearly normal reaction times.
- (b) Moderately short spells (3-6 seconds) with impairment of reaction time.
- (c) Moderately short spells that become even shorter with the light stimulus.
- (d) Longer spells (8-20 seconds) which fail to respond to light stimulus (transient unconsciousness).
- (e) Similar attacks that break up with a loud whistle.
- (f) Severe attacks that respond to neither form of stimulus (severe degree of unconsciousness).

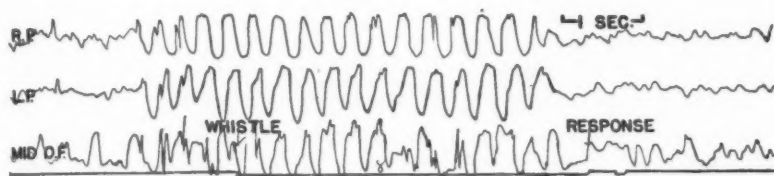


FIG. 9.—Long delay of a response to a loud whistle stimulus during a severe petit mal seizure.

DISCUSSION.

It may be argued that failure to respond to a certain stimulus is no proof of consciousness being lost. Perhaps impairment of consciousness is a more cautious term as "consciousness" is a very elusive word. In this paper it is assumed that a failure to respond to a stimulus, and a subsequent statement that the stimulus was *not* observed, indicates that the patient was in an abnormal state of unresponsiveness for which we employ the term "unconsciousness."

The factor of surprise—lack of attention—or interest was eliminated as far as possible by frequent use of the stimulus during normal electroencephalographic tracings, and served in each case as control material. No data is included where lack of cooperation or understanding played a part.

Infants and children under 6 were for obvious reasons not included. It might well be argued that it is important to determine the exact point in an attack where maximum effect of a stimulus would be felt. We do not know whether this is in the beginning,

middle part, or end of a spell. Further work is planned along this line with special apparatus to set off the stimulus at 1 second, 2 seconds, or longer periods after the spell begins.

More observations are needed to see if the duration of the stimulus plays an important part. In all of these observations, the stimulus was maintained until a response occurred. The stimulus was usually stopped after $1\frac{1}{2}$ seconds if no response occurred, except in special situations where it was continued longer.

CONCLUSIONS.

1. Light stimuli affect the alpha rhythm according to the "all or none" law.
2. Light stimuli have a delayed reaction time in short petit-mal attacks.
3. Light stimuli are not perceived in long petit-mal attacks.
4. Both light and sound stimuli tend to terminate moderately severe petit-mal seizures—the sound being much more effective.
5. When both fail to provoke a response, unconsciousness may be presumed.
6. This method of determining the impairment of consciousness may be useful in:
 - (a) Estimating the severity of petit-mal seizures.
 - (b) The effectiveness of anticonvulsant therapy on the spells.

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DISCUSSION.

DR. HERBERT JASPER (Montreal, Canada).—I am sure we are all very much interested in these very excellent studies of Dr. Schwab, especially with regard to his modern attempt to harness that elusive thing called consciousness. Apparently Dr. Schwab is dealing with one aspect of the clinical conception of consciousness, that of reaction to stimuli. If we can confine our conception of consciousness to this aspect which is part of the general very complex clinical picture of consciousness, certainly his results are of great importance. The analysis of this type of brain disturbance as causing delayed reactions is, I think, quite fundamental. The fact that you can destroy or depress or inhibit petit mal discharges, as they were called, by a loud sound is very fundamental, a point which has been mentioned previously by Dr. Lennox in recommending a stimulating régime for epileptic patients.

The identification of this depression of activity with stimulation with other things that we know about normal brain functioning places this abnormal form of activity with the normal alpha rhythm in being depressed by stimuli. So I think as a general attempt to analyze the true mechanism, we have to thank Dr. Schwab for this work and also appreciate his learning of Hollywood technic.

DR. WILDER PENFIELD (Montreal, Canada).—May I ask Dr. Schwab, when he gives his sudden stimulus in the midst of a seizure, whether he stops that stimulus completely so that the patient responds after having continued in the seizure for a little time. If so, how long an interval can he have between stimulus during seizure and end of the seizure?

I would also like to point out that he must and doubtless has taken into consideration the type of attack he is having, because we know that attacks can be interrupted if the afferent impulses are reaching that part of the brain in which the attacks started in some cases.

DR. ROBERT S. SCHWAB (Boston, Mass.).—I would like to thank the discussors very much for their kind words and for their criticism.

In answer to Dr. Jasper's suggestion that reaction time to stimulation of any kind was only a phase of consciousness, we realize that; and I perhaps was guilty of not making it clear. There is a possibility, of course, that these patients were conscious, that is, they knew where they were and they recognized the signal but were paralyzed or unable to respond because of motor paralysis. In answer to that suggestion, we always ask the patient whether he saw the stimulus or heard the whistle and, if so, why he did not respond. Most of the patients say they did not see the stimulus if they failed to respond to it; a few of them say they forgot to respond to it. These are the patients who respond near the end of an attack. What that means psychologically, I don't know, whether they think that the attack didn't occur. In other words, a good many petit mal patients are unaware of their attacks and if they are told that a light went on and they didn't

respond to it, their obvious reaction would be that they had forgotten about it. We have gotten that response from a number of individuals. We do keep in mind the fact that this is only a part of the whole mechanism of consciousness.

I am not quite clear as to Dr. Penfield's question, whether he means how long do we keep the stimulus on or how long a period elapses before patients can respond. We usually leave the stimulus on until the patient responds to it. In one of the slides that I showed, the light stimulus was on 13½ seconds before the patient responded. We leave the whistle blowing loudly until it breaks through in some way or the attack ends and then we get a response. The longest interval of the light shining following continuation of the attack that I can remember off-hand was 31 seconds before the patient finally responded to the light. Was that the question, Dr. Penfield?

DR. PENFIELD.—I thought that if you stopped it and then the patient after an interval responded or did not respond, it would be a better indication of whether or not he was conscious.

DR. SCHWAB.—In some patients in the early work we tried the stimulus several times in a long attack, in one case three times during the 27-second attack, the stimulus being on approximately a second, in which there was no response, and then as the attack stopped we put it on for the fourth time. The patient then responded. But recently we have been leaving the light on until we get a response, though we have used it several times.

It has been suggested that we investigate the point in an attack where the most likely response to a strong stimulus might occur, in other words, put it on always in the middle or at the end or at the beginning of an attack. That is extremely difficult because you don't know exactly how long the attack is going to be and you have to have a rather careful timing mechanism, but we are going to endeavor in some way to work that out.

A CONVENIENT SELF-ADMINISTERING SCALE FOR MEASURING INTELLECTUAL IMPAIRMENT IN PSYCHOTICS.*

By WALTER C. SHIPLEY, PH. D.,

AND

C. CHARLES BURLINGAME, M. D.,
Hartford, Conn.

This scale was devised expressly to provide psychiatry with a practical diagnostic and research instrument. It was hoped that an objective measure of intellectual impairment would serve three important purposes: (1) that it would aid the physician in general practice in detecting certain mental conditions, particularly in their early stages; (2) that it would assist the psychiatrist in his striving toward diagnostic precision, by indicating presence or absence of intellectual deficits; and (3) that it would further research.

Intellectual impairment, in contrast to mental deficiency, denotes recession to a lower functional level from a previously higher one. It constitutes the difference between a patient's previous capacities and his present ones. The present scale, which is designed to measure this difference, is based on two clinico-experimental observations: (1) the vocabulary level of the early deteriorating patient is affected relatively slightly; (2) his ability to see abstract relationships declines rapidly.

The superiority of the early deteriorate's vocabulary with respect to his other responses is a familiar phenomenon to all who have used the Binet. Babcock, in her *Examination for the Measurement of Mental Deterioration*,¹ makes use of this phenomenon, and expresses deterioration by the extent to which other responses fall

* Read in part at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

From the Neuro-Psychiatric Institute of the Hartford Retreat.

The writers wish to express their indebtedness to Dr. Chester Waterman, Superintendent of the Norwich Connecticut State Hospital, and Dr. Clifford D. Moore, Superintendent of the Fairfield Connecticut State Hospital, for their kind cooperation in this study.

below the vocabulary level. This relative preservation of vocabulary is probably due to the fact that our vocabularies, acquired for the most part when we were young, are not so immediately subject to the obliterative effects of anterograde and retrograde amnesia.

The striking loss in abstract (conceptual) thinking in certain mental cases was demonstrated by Gelb and Goldstein² in 1924. Since that time approximately a dozen papers dealing with abstract-thinking in psychotics have appeared. Three of these, by Kasanin and Hanfmann,⁴ Goldstein,³ and Landis, Zubin and Bolles,⁵ have been read recently before this society. All are consistent in reporting abstract-thinking losses. Thus the available evidence points to a vocabulary-abstract thinking differential in intellectually impaired cases.

Our scale, which was devised with a view to convenience of administration, consists of a vocabulary test and an abstract-thinking test to be used together. Both are of the self-administering, pencil-and-paper type, and are suitable for group as well as individual use. Both carry time-limits of 10 minutes. The vocabulary test shown in Fig. 1, comprises 40 items of the multiple-choice type. Each of the 40 items consists of a test word for which the patient must select and underscore the appropriate synonym from four words appearing opposite it. The abstract-thinking test shown in Fig. 2, comprises 20 items of the completion type. Each item requires the subject to induce a general principle and from it to deduce a specific answer. The answer consists always of a few letters or numbers, and the inductive and deductive processes must be carried out with no assistance whatever.

Scores for the scale were rendered meaningful through standardization on a group of normals. The actual details of this standardization procedure, together with statistical measures of the scale's reliability, have been reported elsewhere.⁶ The object of the present report is to present clinical results. As background for interpretation, however, the standardization procedure must be summarized. The scale was given to a normative group of 1046 individuals for whom intelligence scores were available. The group was composed of students ranging in continuous gradation from the 4th grammar grade through college. Mental-age equivalents were established empirically for each score by reference to the normal performance.

SHIPLEY-HARTFORD C.Q. SCALE
VOCABULARY TEST

NAME _____

In the test below, the first word in each line is printed in capital letters. Opposite it are four other words. Draw a line under the one word which means the same thing, or most nearly the same thing, as the first word. A sample has been worked out for you. If you don't know, guess. Be sure to underline the one word in each line that means the same thing as the first word.

LARGE	sample			
	red	<u>big</u>	silent	wet
begin here				
(1) TALK	draw	eat	speak	sleep
(2) PERMIT	allow	saw	cut	drive
(3) PARDON	forgive	pound	divide	tell
(4) COUCH	pin	eraser	soda	glass
(5) REMEMBER	swim	recall	number	defy
(6) TUMBLE	drink	dress	fall	think
(7) HIDEOUS	silvery	tilted	young	dreadful
(8) CORDIAL	swift	muddy	leafy	hearty
(9) EVIDENT	green	obvious	sceptical	afraid
(10) IMPOSTOR	conductor	officer	book	pretender
(11) MERIT	deserve	distrust	fight	separate
(12) FASCINATE	welcome	fix	stir	enchant
(13) INDICATE	defy	excite	signify	bicker
(14) IGNORANT	red	sharp	uninformed	precise
(15) FORTIFY	submerge	strengthen	vent	deaden
(16) RENOWN	length	head	fame	loyalty
(17) NARRATE	yield	buy	associate	tell
(18) MASSIVE	bright	large	speedy	low
(19) HILARITY	laughter	speed	grace	malice
(20) SMIRCHED	stolen	pointed	remade	soiled
(21) SQUANDER	tease	belittle	cut	waste
(22) CAPTION	drum	ballast	heading	ape
(23) FACILITATE	help	turn	strip	bewilder
(24) JOCOSE	humorous	paltry	fervid	plain
(25) APPRISE	reduce	strew	inform	delight
(26) RUE	eat	lament	dominate	cure
(27) DENIZEN	senator	inhabitant	fish	atom
(28) DIVEST	dispossess	intrude	rally	pledge
(29) AMULET	charm	orphan	dingo	pond
(30) INEXORABLE	untidy	involatile	rigid	sparse
(31) HERRATED	dried	notched	armed	blunt
(32) LISSOM	moldy	loose	supple	convex
(33) MOLLIFY	mitigate	direct	pertain	abuse
(34) FLAGIARIZE	appropriate	intend	revoke	maintain
(35) CRIFICE	brush	hole	building	lute
(36) QUERULOUS	maniacal	curious	devout	complaining
(37) PARIAH	outcast	priest	lentil	locker
(38) ABET	waken	ensue	incite	placate
(39) TEMERITY	rashness	timidity	desire	kindness
(40) PRISTINE	vain	sound	first	level

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FIG. 1.

SHIPLEY-HARTFORD C.Q. SCALE
ABSTRACTION TEST

NAME _____

Complete the following. Each dash (.) calls for either a number or a letter to be filled in. Every line is a separate item. Take the items in order, but don't spend too much time on any one.

start here

- (1) 1 2 3 4 5 _
- (2) white black short long 'down _
- (3) AB BC CD D_
- (4) Z Y X W V U _
- (5) 1 2 3 2 1 2 3 4 3 2 3 4 5 4 3 4 5 6 _
- (6) NE/SW SE/NW E/W W/_
- (7) escape scape cape _
- (8) oh ho rat tar mood _
- (9) A Z B Y C X D _
- (10) tot tot bard drab 537 _
- (11) mist is wasp as pint in tone _
- (12) 57326 73265 32657 26573 _
- (13) knit in spud up both to stay _
- (14) Scotland landscape scapegoat _
- (15) surgeon 1234567 snore 17655 rogue _
- (16) tam tan rib rid rat raw hip _
- (17) tar pitch throw saloon bar rod fee tip end plank _ meals
- (18) 3124 82 73 154 46 13_
- (19) lag leg pen pin big bog rob _
- (20) two w four r one o three _

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FIG. 2.

This was done in identical manner for both the vocabulary and abstraction tests. Thus, through identical standardization the two tests were made comparable. In addition, mental-age equivalents were established for summated scores for the two tests. This latter procedure enhanced the value of the scale by rendering it useful as a measure of intelligence as well as of impairment.

INDEX OF IMPAIRMENT—THE CONCEPTUAL QUOTIENT (C. Q.).

For simplicity, as well as to afford comparisons between individuals at different I. Q. levels, a special impairment index, the conceptual quotient (C. Q.) was devised. Virtually the quotient amounts to the abstraction (conceptual) age divided by the vocabulary age. Actually it was derived from a slightly more intricate formula.* Its formulation comprised three steps. First, the median abstraction age accompanying each vocabulary age was determined for the normal group, to give the "predicted abstraction-age." Next, the obtained abstraction age was divided by the predicted one. Finally, to eliminate decimals the quotient was multiplied by 100. Scores below 100 would be in the direction of impairment; those above it would indicate superior abstraction ability relative to vocabulary. The lower part of Fig. 3 shows the distribution of C. Q.'s in the normative group of 1046 individuals. Note that the values cluster about 100; the median is 100, the mean, 100.06, and the middle 50 per cent of the cases falls between 90 and 110.

It was assumed that normal persons, regardless of native intelligence, would approach C. Q.'s of 100. This assumption proved to be roughly true within normal limits. An unpublished side-study with adult mental defectives, however, showed an unquestionable tendency towards lower C. Q.'s in subnormals. In presenting the results from mental cases the data from all individuals failing to earn a vocabulary age of 14 years were excluded. This selective measure was employed to exclude from the study the following individuals: (1) the feeble-minded; (2) those with serious language difficulties; and (3) those who had deteriorated so profoundly that their vocabularies were affected.

*C. Q.'s may now be read directly from tables, as they have been worked out for all possible combinations of vocabulary and abstraction scores.

VALIDATION PROCEDURE.

To test its efficacy the scale was given both to state and private mental hospital patients. The former were examined at the Norwich and Fairfield state hospitals; the latter, at the Neuro-Psychiatric Institute of the Hartford Retreat. The sole object of the program was to test the validity of the scale; no attempt was made to survey the respective hospital populations.

In testing at the state hospitals the following procedure was employed. The testing was begun on the better wards and directed thence progressively to wards on which the patients were less and less able to cooperate. When a ward was reached on which a majority was unable to cooperate, no attempt was made to test further. We venture the guess that all the data were obtained from the upper 20 per cent with regard to preservation. At the private hospital the majority of patients lent cooperation. In comparing the two groups it should be recognized that they represent different material psychiatrically. The state hospital cases were practically all chronic and psychotic; the private hospital cases were early ones for the most part, and many were non-psychotic.

RESULTS.

After eliminating the uncooperatives and those below the 14-year vocabulary level, there remained 374 patients tested by the scale. Of these, 203 were from the private hospital and 171 were from the state hospitals. Practically all had been tested without previous knowledge of diagnosis.

The C. Q.'s for the two groups are given in the upper part of Fig. 3. Medians and interquartile ranges (the range for the middle 50 per cent of the cases) are also indicated. Certain relationships should be noted. Only 10 of the normals (less than 1 per cent) fall as low as the median of the state hospital group. The median of the private hospital group falls above the interquartile range of the state hospital group, but below the normal interquartile range. Finally, the interquartile ranges for the normals and state hospital cases do not overlap with each other, but both overlap with the private hospital interquartile range.

This evidence indicates, presumably, that the scale measures intellectual impairment. Caution must be exercised in drawing such

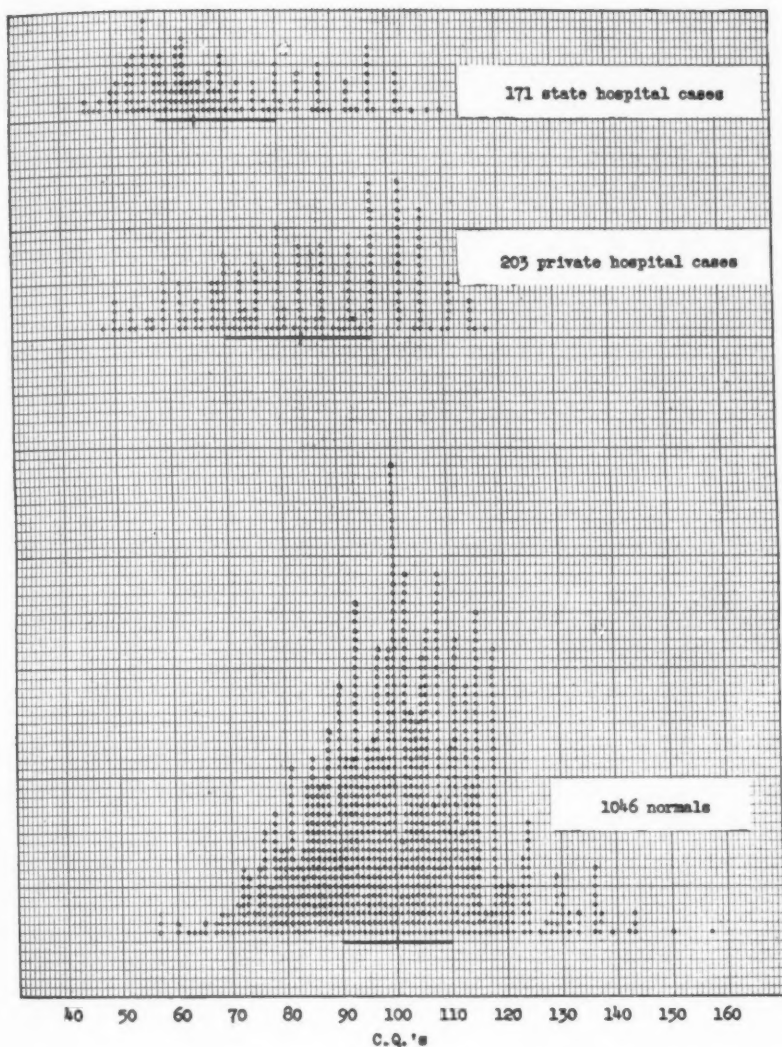


FIG. 3.—Showing distribution of C.Q.'s for normals and for private and state hospital cases. Medians are indicated by vertical, and interquartile ranges (middle 50 per cent of cases) by horizontal lines.

a conclusion, however, because of the lack of comparability between the respective groups tested. The normals differed from the mental cases both in age and in previous experience with tests, and the private and state hospital cases differed in socio-economic and educational background. Consequently, another type of comparison was made. This was in terms of diagnostic classification, and was carried out separately for the private and state hospital data. Only those classifications represented by 5 or more cases were included in the analysis.

The data from the private hospital are presented by diagnostic category in Fig. 4; medians and interquartile ranges are indicated. The organic cases—the seniles, neurosyphilitics, arteriosclerotics and Korsakoffs—fall lowest, while the two non-psychotic groups—the psychoneurotics and psychopathic personalities—approach the normals. The state hospital data are given by diagnostic categories in Fig. 5. The trend is the same; the neurosyphilitics (the only organic classification represented by 5 or more individuals) fall lowest, and the psychoneurotics approach the normals. In Fig. 6 the two types of hospital data have been roughly combined by plotting midpoints between medians. The strikingness of the trend confirms the contention that the scale measures intellectual impairment.

SUMMARY AND CONCLUSIONS.

A quick, objective, self-administering scale for measuring intellectual impairment has been described. It requires but 20 minutes to give and 2 minutes to score, and is adapted to group, as well as individual use. It consists of a vocabulary and an abstract-thinking test which are used together. Impairment is measured in terms of the abstract-thinking deficit taken in relation to vocabulary level. For convenience, a special impairment index, the C. Q. (conceptual quotient), is employed; it represents the ratio of the patient's abstract-thinking ability to that of the average normal individual at his vocabulary level.

The scale was standardized on over a thousand normals for whom I. Q.'s were available; mental-age equivalents were established for the vocabulary and abstract-thinking tests, as well as for the two tests combined. This method of standardization rendered

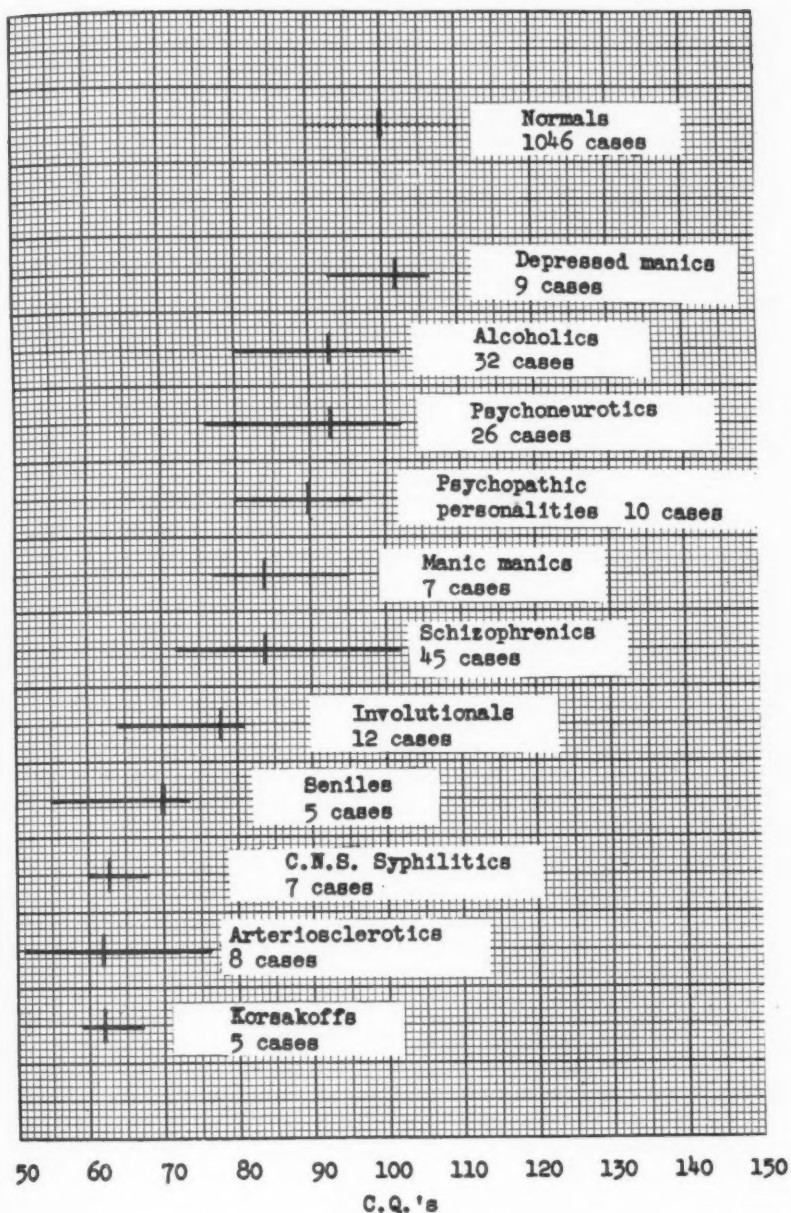


FIG. 4.—Graph showing median C.Q.'s and interquartile ranges (middle 50 per cent of cases) for the private hospital diagnostic sub-groups.

the scale useful as a measure of intelligence, as well as of intellectual impairment.

To test its efficacy the scale was given to several hundred mental patients from both private and state hospitals. Comparison of the

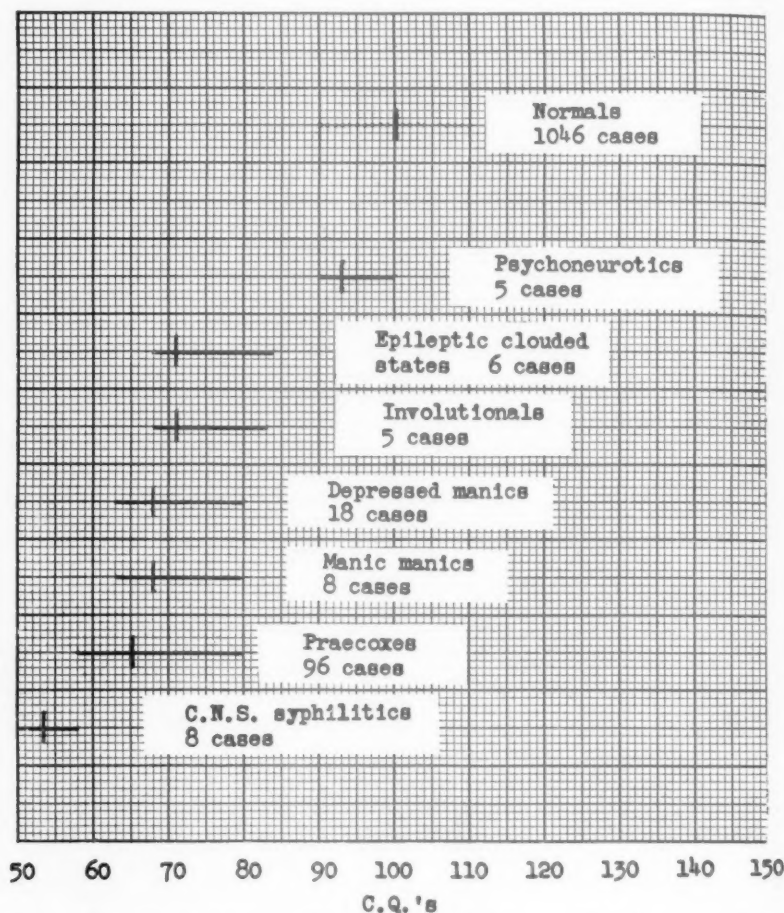


FIG. 5.—Graph showing median C.Q.'s and interquartile ranges (middle 50 per cent of cases) for the state hospital diagnostic sub-groups.

C. Q.'s thus obtained with those of normals yielded the following significant findings. (1) Only 5 per cent of the state hospital cases reached the median of the normals, while less than 1 per cent of the normals fell as low as the state hospital median. (2) The private

hospital median fell midway between that of the normals and state hospital cases. Analysis by diagnostic groups showed the psychoneurotics and other non-psychotics to approach the normals, with the functional psychotics falling lower, and the organic psychotics lowest of all. This trend was both striking and consistent.

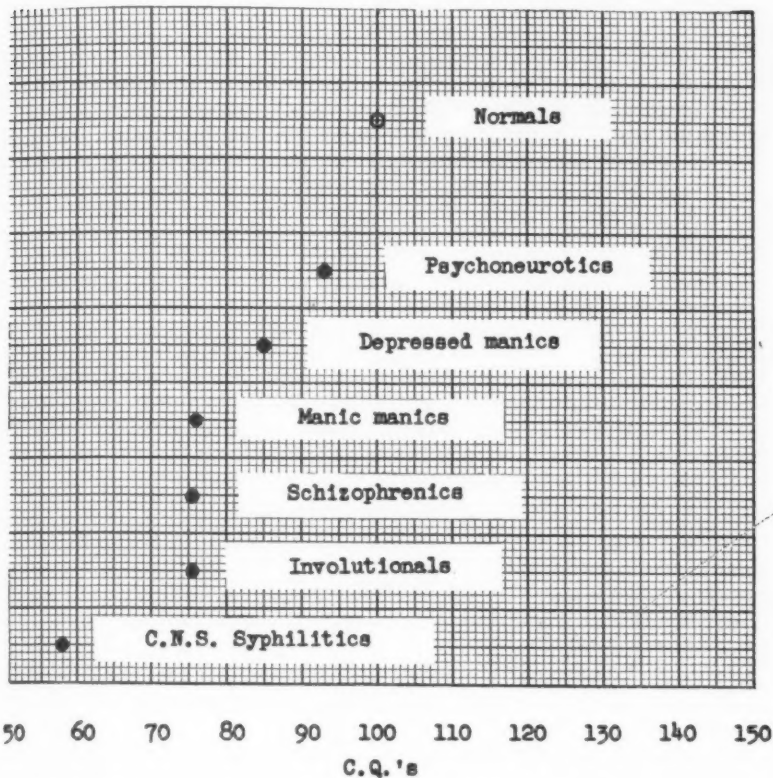


FIG. 6.—Private and state hospital data combined. The dots represent midpoints between the private and state hospital median C. Q.'s

The evidence confirms the original tenets; the scale has been found useful in measuring intellectual impairment. It is best suited for work with relatively early cases of average or superior intelligence. It is not suited for use with markedly deteriorated cases, and its use with subnormals must await the establishment of further norms.

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DISCUSSION.

DR. THEOPHILE RAPHAEL (Ann Arbor, Mich.).—I have very much enjoyed listening to Dr. Shipley's and Dr. Burlingame's interesting presentation. The authors really seem to have developed a truly helpful practical device, assuming it has been sufficiently standardized for reliability, as appears to be the case, for establishing concretely and with a certain precision what until now has been largely left to clinical impression.

In this connection, albeit a very small point, I would be interested in the reason for the use of a new vocabulary set-up as opposed to one of those already in existence, which are quite well standardized, such as the Binet or Army Alpha.

DR. C. M. CAMPBELL (Boston).—I have listened with very much interest to this paper, but I have not personally utilized these tests and have therefore no special data to contribute.

It is, of course, a great advantage to have some special method of coming to a conclusion as to the extent of intellectual deterioration and also to differentiate between the types of deterioration in cases of different nature. The Goldstein tests have been extremely useful in regard to establishing the probability that the case shows a deterioration based upon some organic process, and anything that gives further precision to our methods of differentiation and to our analyses of intellectual deterioration is to be welcomed. We are indebted to the authors for presenting this material.

DR. WALTER C. SHIPLEY.—This test is still somewhat in its provisional stages. We have found it very useful in our setup and we found evidence that it would be useful on some of the early and higher grade state hospital

cases. However, we must caution about generalizing from one situation to another. What we would like to do is to encourage the use of the test purely provisionally by others, in order to test further its efficacy.

Replying to Dr. Raphael's question about the vocabulary test, I might say that our reason for not using the Binet vocabulary test is primarily that it is not self-administering; that is, it requires the doctor or psychologist to sit down with the patient and ask him to define each of a number of words. That takes time. We wanted to use a self-administering test in which you simply give the idea to the patient and let him go ahead.

Another reason for devising our own test was that mental age units are not absolute. Mental age score is dependent somewhat on your method of arriving at it, and if we had used some other test our vocabulary scores and abstraction scores would not have been so nearly equivalent as when standardized by exactly the same method on exactly the same people.

Thirdly, I might say that we designed our vocabulary test, the instructions and all, so that it could be used in a psychiatric situation.

SOME REMARKS ON THE DIAGNOSIS OF THE PSYCHOPATHIC DELINQUENT.*

By JOHN CHORNYAK, M. D., D. Sc. (Med.), PITTSBURGH, PA.

This paper is limited to one type of psychopathic delinquent, namely the egocentric, emotionally unstable type of psychopathic personality according to Healy's¹ classification, the predominantly aggressive type according to Henderson,² and the active autists and the egocentric according to the classification of Kahn.³ It is the group referred to by the original writers in this field as the "moral imbeciles," the "moral defectives," etc.

Our literature and knowledge of this group is so inadequate that some psychiatrists have doubted its existence. Those of us who work in psychiatric clinics in courts, however, continuously have to deal with this type of abnormal personality. We believe that this group represents an extremely serious type of offender and that psychiatry is obligated in aiding society, through the courts, to establish definite diagnostic criteria for the segregation of this type of psychopathic personality from the other groups of delinquents. The Gluecks⁴ state this need very lucidly in their book on *Later Criminal Careers* when they point out that the greatest need in criminology is the early differentiation of the essentially "environmental delinquents" from the essentially "organismal delinquents." The need for this diagnosis, as the Gluecks observe, lies in the fact that these individuals form an important part of the recidivist group of criminals.

The first step in establishing diagnostic criteria is the determination of the presence of complete egocentricity. A person cannot safely be designated as egocentric without a careful examination of his entire life history. This life history will reveal that self-centeredness and absolute selfishness characterize all his social rela-

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tionships. The family, teachers, social workers—in fact, all who come in contact with such a personality—soon voice their utter inability to establish rapport. The child behaves as if he has no regard whatever for the feelings and welfare of others. Even intensive relationship with the psychiatrist fails to result in rapport. In addition to the longitudinal life history a period of observation within a controlled environment is essential to differentiate between true egocentricity and the results of the activity of the principle of “circular response.”¹⁴ In our detention home we find that the reports from the supervisors consistently indicate the child's inability to adjust with his own age-group. The reports usually read: “He loves the center of the stage,” “Won't play ball unless he is the leader,” “Will not participate in games unless he has started them,” “Does not cooperate with the other children in a give-and-take spirit,” “Loves to be given a chance to act in front of the whole group.” Unless the supervisors and the children cater to this egocentricity, he responds with sulkiness, temper tantrums, attacks of violent destructive behavior and very lewd swearing. Such reports continue even after such a child has been in the detention home for months. There is absolutely no improvement, in contrast to that shown by the other types of delinquents over a similar period. Interestingly enough, our psychologist * points out that the Rorschach response record in the few instances in which it was done in our clinic, gave an indication of the type of emotional adjustment that one would consider characteristic of egocentricity.

Egocentricity is a normal stage early in childhood of personality maturation. It is our contention that this type of psychopathic personality is fixed at this early egocentric level because of damage to the most recently acquired areas in the cerebrum. One of the effects of this damage in the angular and supra-marginal gyri is reflected in abnormalities of the body schema. Therefore any type of study that will establish the abnormality of the body schema is of great aid in contributing to the diagnosis. One method that gives information on the body schema is the familiar Goodenough drawing-of-a-man test.

This test reveals quantitative and especially qualitative defect of the body schema, indicating a possible mechanism for the ex-

* George A. Geil.

treme egocentricity as well as for some of the intellectual inefficiency. Freud,⁵ Schilder,⁶ and others have stressed that the postural model of the body goes deeply into the structure of the personality. Bender, working with the Goodenough test, is quoted by Fingert, Kagan, and Schilder⁷ as stating: "The drawing of the child is an experiment in the visual motor cutaneous and visual impressions." These authors point out that "according to this formulation," the Goodenough Test can therefore be regarded "as an expression of total organization which incorporates not only technical abilities, but also total tendencies."

Freud stressed that the ego is first and foremost a body ego, and definitely equated this concept with the "cortical homunculus of the anatomists." It is not only the system perception but also the body image which, according to him, aids in the differentiation of the ego from the id. The introjection of the ego ideals is therefore through the body image. It is as if one has to have a complete body image before identification with ego ideals and their introjection can occur. In this type of psychopathic personality, at least in the typical instances, there is little evidence of ego ideal or super-ego; if present at all, it appears to be unable to repress any of the instinctual activity. If we consider mature or altruistic behavior as due to complete identification, then we can readily see that the defective body schema, which prevents the formation of effective ego ideals, makes it difficult for identification to occur and thus can account for the lack of altruistic behavior by this type of psychopathic personality. "In other words," as Wilson and Pescor⁸ state, "they are perennial children, Peter Pans who cannot learn to curb their primitive impulses and urges in the interests of society nor outgrow the childish notion that the world is made for their pleasure and exploitation."

This defective body schema as indicated by the drawing-of-a-man test is likewise one of the indices for the intellectual inefficiencies so characteristic of this type of psychopathic personality. Some writers have considered the intellectual factor of the personality to be intact, referring to this group as moral defectives, moral imbeciles and inferring that there is no disturbance of the intellectual phase of the personality. Present-day methods, however, suggest that this concept is only an impressionistic one based on the absence of hallucinations and psychotic delusions, conversa-

tion being normal since the association processes are not psychotically disturbed.

Qualitatively and quantitatively the drawing of a man is very defective and frequently entirely lacks correlation with the Stanford-Binet mental age. It presents all sorts of difficulties, many of them of an agnosia type. The drawing, for instance, may indicate a finger agnosia when the child is unable to draw the hand. It is remarkable that an intellectually superior child is occasionally observed trying to cover up this difficulty by drawing the hands in the pocket, or crossing them behind the back.

It is not surprising, if the drawing indicates finger agnosia, to find that frequently the child has had difficulties with arithmetic and writing. Schilder⁹ and others¹⁰ have emphasized that this finger disorientation is associated with difficulties in writing and in reckoning. We believe that this qualitative difficulty in the drawing as well as the frequent discrepancy between the mental age on the drawing and the mental age on the Stanford-Binet scale are due to actual structural defect in the area of the cerebral cortex responsible for the body schema and not to functional disorganization of that area as shown in hysteria and during shock therapy in schizophrenia.⁷

Intellectual inefficiency can also be readily inferred from the Stanford-Binet findings. There may be a high I. Q. but frequently there is a wide scatter due to a very low basal age. The basal age on the Stanford-Binet we have found to be similar to the mental age on the Goodenough drawing-of-a-man test and, according to our psychologist, there is an indication of intellectual inefficiency on the Rorschach that likewise is similar to the basal age. As previously indicated we frequently find reading, writing and arithmetic disabilities. The word-association tests do not indicate any psychotic disturbance of the association process.

The school histories usually show that these children have failed to make the scholastic achievements one might expect from their Stanford-Binet mental ages; reports of their behavior show clearly that they have failed to profit by experience. It appears in light of the study made by Wile and Davis¹¹ that the basal age is more closely correlated with school achievement than the Stanford-Binet mental age. We therefore can more readily understand the intellectual inefficiency of this group in the light of their low basal

age. The other factor present in this intellectual inefficiency can be better understood in the light of Lashley's theory of learning. Lashley indicates something strikingly similar to the production of critical physiological gradients in brain areas as the basis for modifications in behavior. His report sets up the hypothesis that when such gradients pass certain critical slopes, emotional behavior ensues. The implication is that the relationship between emotion and learning may be very direct, because both may be phenomena involving the altering of gradients or of "ratios of intensity," as Lashley puts it.

It is our theory that this type of psychopathic personality results from structural damage to the phylogenetically youngest structures of the cerebrum and that therefore the head end of this gradient is destroyed, thus making learning extremely difficult. In addition to this organic factor there are of course the emotional difficulties that ensue from the child's egocentricities which affect his attitude in school so as to seriously hamper learning.

The loss of this head end of the gradient likewise could explain the extreme emotional instability and impulsivity, and together with the defective body schema might be considered as indicating the lack of integration at that highest level of personality at which the individual has the greatest command over his behavior. Although we dislike to use such a term as will power it at least crudely indicates that this subjective feeling of voluntary control of behavior is present to the greatest extent at the highest level of personality integration. This type of psychopathic personality does not appear to be integrated at this highest level and this behavior can be said to indicate a defect in the conative aspect of the personality.

Frequently these children express amazement at the impulsive nature of their behavior. It is as if the personality at the higher level of integration still can look on bewildered by the individual's own acts. This phenomenon reminds one of the report by Penfield¹³ that epileptics, as a result of cortical stimulation, may vocalize, and refer to this vocalization as something forced out of them and not due to a voluntary act. The involuntary impulsive behavior of the psychopathic personality frequently results in a self-thwarting act. This is illustrated by a boy who acknowledges that he was placed in just the type of foster home in the country

that he desired with foster parents who took an interest in him and who had even bought him a pony. The child describes this enthusiastically, saying that these people were wonderful to him and that he was happy, yet "something just came over me and I ran away." The longitudinal history of this boy reveals many such self-thwarting acts.

In a true psychopathic personality of this type, impulsive behavior continues even during institutionalization. These delinquents are committed to one institution after another, with the authorities of each institution clamoring for their release because their extremely abnormal behavior so seriously interferes with their program.

In addition to their egocentricity, their emotional instability and their self-thwarting behavior, they are uncontrolled in their sexual activity. There appears to be no differentiation or maturation of the sexual impulse. The Rorschach response record in the few cases in which this test was done in our clinic, indicated an emotional immaturity as evidenced by a lack of control over the more instinctive layers within the personality structure. One child stated in a two-hour talk to a class of students: "I know all about sex and I've done everything." They participate in all forms of sexual activity. As one psychiatrist put it: "The lid is off the id." It is especially this aggressive undifferentiated sexual activity that causes trouble in institutions. These individuals present also a loss of normal reciprocal relationship between aggression and the sexual drive. They are not inhibited sexually when in a state of anger or during aggression but actually become sexually excited, and we see sado-masochism. As another evidence of the exposure of the unconscious, it is interesting frequently to find conscious incestual phantasying and incestual swearing. There appears to be not only a lack of differentiation of the sexual impulse and a lack of the normal reciprocal relationship between unconditioned drives, but also a complete lack of repression from the super-ego or ego-ideals or from any introjected cultural factors.

Ego content consists of their immediate experiences and crude unsublimated material dealing with their unconditioned drives. The Rorschach response record showed a definite lack of richness in the ego content completely out of proportion to what one would expect from their Stanford-Binet scores. There is no complex

structure of introjected culture in the ego, or at any rate there appears to be no repressive force to this factor of the psyche.

We have already stressed the intellectual inefficiency of these psychopathic personalities. Despite high I. Q.'s, they do not learn from experience irrespective of the number of times they are brought before the court; although they sound sincere in their expressed desire to reform, they continue to recidivate. They are creatures of the present. The future is as nothing to them. Their behavior is characterized by this peculiar lack of judgment in that a decision in the present is not influenced by a recollection of the past nor by a projection into and consideration of the future. They are pretty much stimulus-response organisms. It is as if there were no ego buffer between the environment or stimuli and their unconditioned drives and egocentric wishes. It is interesting to hear them say, "I have no will power. I don't know why I do it." Even as late as adolescence it is rare to find character changes indicating an acceptance of this anti-social behavior. We believe that acceptance of such behavior, with resulting character changes, is a mechanism of rationalization to enable these individuals to adjust even if the adjustment is on a criminal plane of conduct. It becomes a relief for them to be able to state and to believe that their anti-social behavior is more desirable and sensible than the conforming type of socially acceptable conduct.

An examination of the diagnostic criteria presented thus far indicates that these people must be studied intensively. Study should include a complete social history following the outlines of Healy and others in child psychiatry, a complete neurological and general medical examination, and psychometric studies as well as psychiatric interviews. We might add that pneumo-encephalographic studies are also indicated. In the few encephalograms that we were able to obtain, cortical atrophy was revealed. In psychiatric interviews we have found the written-own-story technique to be very effective, since children of this type are so self-centered that they enjoy revealing their careers. They also derive great pleasure from giving oral accounts of their lives. Such a complete study gives a longitudinal life section as well as a cross-section picture. The opportunity to observe such children in the controlled environment of a detention home is likewise a great aid in establishing the diagnosis.

In addition to this usual method of study we believe that certain theoretical considerations aid in the diagnosis. As previously stated, the presence of complete egocentricity appears to be the fundamental feature. Our theory is therefore that these children have sustained cerebral damage of a certain distribution during the normal egocentric period of personality maturation. The medical history is therefore of tremendous importance in determining etiology as Healy indicates in his book *Personality in Formation and action*.¹⁴ An anoxemia of serious enough degree to produce damage to the central nervous system is especially significant. Cases occur in which the parents definitely state that the difficulties began after serious whooping cough or pneumonia, which, from the clinical history, obviously was associated with severe asphyxia. Only recently we heard a father describe this change dramatically when he lifted a card and turned it over, saying, "My boy—he change like that."

We have discussed in an earlier work¹⁵⁻¹⁶ the significance of anoxemia in the etiology of this type of psychopathic personality. We pointed out that the nerve cells most vulnerable to anoxemia are those in the areas most recent phylogenetically as well as ontogenetically, and that if this damage occurs early in childhood during the egocentric phase of personality growth we find this type of egocentric psychopathic state. No further differentiation into the mature, altruistic level of personality can occur after such damage. It is of interest that the Rorschach response record, in the few cases obtained, indicated a "probable pathological condition of the brain."

We do not exclude other etiological factors, for example head trauma early in childhood, which may lead to a similar distribution of cortical atrophy. Of course it would be only the rare case of trauma that would result in the same neuropathology as that resulting from anoxemia. We contend that it is because of this difference in the neuropathology that the psychopathic personality of the egocentric type differs from those who have manifested personality changes as a result of encephalities or brain injury; the latter tend more strongly to develop self-control and do frequently respond favorably to therapy. We would simply stress that the damage occurs during the egocentric phase of personality maturation.

tion and that the cortical areas responsible for the body schema have sustained serious injury. The possibility of some cases being due to a sort of genetically determined abiotrophy of the most recently acquired cerebral structures cannot of course be excluded.

The picture is further complicated as to diagnosis by the superimposition of such damage at the egocentric stage of personality maturation in an individual who genetically is pre-psychotic or extremely introverted. We believe we have studied such mixed types and they form very complex clinical pictures of abnormal personality structure. Reference is made to Henderson's discussion of the relationship of the psychopathic personality to the psycho-neuroses and psychoses for further elucidation of this mixed type of psychopathic state. It is likewise our view that there is a gradation from the typical aggressive egocentric psychopathic state through milder types difficult to differentiate from the environmentally conditioned delinquent. We would also like to emphasize that at least most typical cases can be differentiated from the psychopathic personalities due to encephalitis with the basal ganglia predominantly involved, from those due to chorea, and from those due to trauma.

A question arises: Are the psychopathic traits of this type inevitably anti-social and criminal or is some of their delinquent and later criminal behavior conditioned by sociological factors such as living in a highly delinquent area? We do not have any final answer but would like to state that a few such cases in our private practice presented such criminal behavior despite living in the economically upper middle class all their lives. We should like to express our warm agreement with Henderson's statement that he is "opposed to the conception of those who believe that the great preponderance of behavior disorders is superimposed by bad training or environment or both upon a perfectly normal mentality. Such an attitude is pure Watsonian behaviorism, a most suggestive but grossly exaggerated polemical point of view which may have great value in that respect, but fails in its clinical application because it so boldly sweeps away everything that does not agree with its original premise."

These egocentric emotionally unstable psychopathic personalities with self-thwarting behavior belong to a group that has long

been recognized as exhibiting anti-social reactions or criminal behavior from earliest childhood. While in most instances their anti-social reactions are episodic at least during childhood, later they are almost continuous. They form our most serious type of delinquent and criminal. The tremendous harm that is done to society by these psychopathic personalities should force psychiatry not only to recognize their numerical and social significance but also to establish diagnostic criteria for their segregation.

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DISCUSSION.

DR. A. T. CHILDERS (Cincinnati, Ohio).—This type of psychopathic delinquent is of sufficient frequency and seriousness to make early and positive diagnosis urgent. Our thinking on this problem has not progressed much beyond the stage of description. It has long been known that frontal lobe injuries are often associated comparatively shortly afterwards with rather profound personality changes affecting the higher or more mature aspects of social conduct. Somewhat similar changes have been seen also in certain encephalitic children and adults. In these the injury has been definite and the time interval between cause and effect relatively short. The writer referred to proofs from pneumo- and electro-encephalographic studies. Recently Reuben discussed the possibility of localizing sites of cerebral injury by the electro-encephalograph. We are being surprised more and more by the revelations of brain injury from the electro-encephalograph in previously unsuspected and so-called functional conditions. We may come to see the author's theory substantiated by this and other exact methods. At this stage, however, while his contentions seem plausible, his proofs seem applied at a somewhat speculative distance. Since my knowledge of the Goodenough drawing-of-a-man test, the Rorschach and the Stanford-Binet test is somewhat limited, and since I have not read all the writer's references for this paper, I hesitate to discuss his applications in these respects. It may be as Freud has said, that the super ego, ego ideal or social ideal in these delinquents is related to a lack of development of concepts of the body schema. It may be that such functions are performed in the phylogenetically most recently developed portion of the human brain.

These things may all ultimately be proved or disproved. It is my impression that there are rather wide gaps between the possible and actual relationships which can be accepted as proved. My understanding is that the Goodenough drawing-of-man test is applicable chiefly to rather young children, say under 6 or 7 years of age. Certainly the super ego is not believed to have developed very fully by that age. However, it would be highly desirable to have an early clue to the possible later development of a psychopathic personality. Later longitudinal personality studies indicate that significant trends go back into early childhood.

Insofar as structural brain injury has been done in these psychopathic cases, it must be assumed to have occurred in the early years. It must be assumed also in all cases, and further, that the brain localization is approximately the same in order to fit in with the rather remarkable similarity of personality deviations they all show. If brain injury in the chief causal factor, then prognosis and treatment are uncertain, and a long period of specialized

re-training is indicated. A child so afflicted may be regarded as having a permanent handicap and his peculiar personality traits may be viewed as regressive methods of meeting the usual social situations.

I would like to make some observations in a different direction although not necessarily opposing the viewpoint of this paper. If brain injury, either from accident or infection, is primarily causal, we should expect these cases to come from all kinds of homes and social levels. Of course favorable conditions would be in general protective. My impression is that the psychopathic delinquents very frequently come from a certain kind of home situation, which I shall not try to describe beyond saying that the parental influences could be ascribed as favoring many of the traits mentioned in Dr. Chornyak's paper.

Another personal observation or impression is that there are definitely more aggressive egocentric psychopathic delinquents among boys than among girls. Our culture favors more aggressive behavior among males which would of course expose boys to more chances for injury. Female children, however, certainly get head injuries and are exposed to infection. We should expect somewhat similar effects in both sexes if a particular side of the brain has been injured.

There is also an observation regarding the age at which a child is diagnosed and the kind of management he gets at certain ages. For example, I have seen children who were considered definitely psychopathic when small, but in later years could not be considered so; and I have seen others who in an earlier stage did not present characteristics at all suggestive of such psychopathy, yet some years later fulfilled practically all the criteria for such diagnosis. Usually unfortunate changes of management ran parallel to the changes in the child.

These are impressions of experience and not based upon actual statistical studies. They may still fit in with Dr. Chornyak's contentions. However, until more exact methods of approach connect cause and effect more directly, other kinds of studies such as of statistics, sex differences, social conditions, family relationships and faulty early training, as well as batteries of psychological tests will still be required. In spite of the tenor of some of my remarks, I personally believe that it will be ultimately proved that brain injury plays an important causal rôle in the development of this particular kind of psychopathic personality.

DR. EARL D. BOND (Philadelphia, Pa.).—In this paper we have been asked to consider two very different phases, first, the special type of psychopathic personality, a problem of great interest because of many misunderstandings between the courts and the psychiatrists. It seems to me that Dr. Brill used the term moral insanity, whereas most of us have been thinking—if we use an old-fashioned term at all—of moral defect. And I think it is a little troublesome to call this kind of psychopath egocentric, because we so commonly use the word "ego" in another sense. It would be fair to call it, I suppose, idcentric, as I take it that there has been a lack of development either of the ego or the super-ego. Then we've been asked to consider a

tremendously different thing—anoxemia. I've had for a year Dr. Chornyak's monograph on anoxemia on my desk, and I've turned it over and over again to get stimulating ideas. It's a real discussion. On the other hand, Dr. Chornyak has been trying to put these two different ideas, that of a certain kind of psychopath and a certain kind of brain damage together. That's a difficult job. It seems to me that he has established that sometimes anoxemia plays a part in the development of some psychopaths, but I should like to associate myself with what Dr. Childers said, that every step along this way has to be examined with a good deal of care. How many children have these diseases which bring about anoxemias and then go on without developing this type of psychopathy? I have in mind the case of a graduate of one of our best colleges, one of our best medical schools, who is showing typical psychopathic behavior at the present moment. In infancy there was extreme malnutrition; at the end of the first year of life he weighed less than when he was born. At four years of age he was thrown out of a swing and was unconscious for over 24 hours. There seems to be a case that could be well worked out. This boy was under the domination of a younger sister, twice as large and three times as strong as he was. He was endlessly interfered with by parents who held up impossible ideals before him. So at once you get into complications that are almost too great to warrant conclusions at the present stage.

DR. WALTER BROMBERG (New York, N. Y.).—To begin with, the specific diagnostic point of the egocentricity is probably valid although it does not complete the picture. But the attractive argument that there is an organic background to this is not to my mind so compelling. It's attractive and makes psychiatrists feel less helpless than they did when Pritchard invented the term "moral imbecile" in 1835. On the other hand, it seems to me that the organic substratum is not proven, and as a practical psychiatrist one is more apt to try to do some work with these cases in the way of therapy.

The argument that the body schema is located in the angular gyrus and proved there by other cases, does not give a right to the conclusion that the Goodenough reactions which show a difficulty in body schema indicate the presence of organic disturbance. In my experience the Goodenough test brings out three points: intelligence, lack of coordination and a question of perception. The only thing we can say, that perception in the drawing can be linked up specifically with organic disturbance or even unconscious material. This is, of course, a theory but I just want to bring out that our cases do not show that as regularly as Dr. Chornyak's. Also the second criterion of intellectual inefficiency we find in non-psychopathic individuals, people who at the age of 18 and 20 start their criminal career. I take as a very important diagnostic criterion the fact that psychopathic personalities of this group start early with antisocial behavior, at 6 or 9.

The whole question of hypogenesis which Dr. Bond has worked with for many years and Dr. Chornyak and others have discussed, has this interesting sidelight. It is true that encephalitic individuals show hypogenesis. We

have seen hypogenetic youths, especially children, in whom there is no history of encephalitis and no physical signs. And I have come to think of idiopathic hypogenesis without any demonstrable organic background which accounts for some of the constant activity of young boys and young men, which somehow fades with maturity. In other words, some sort of a physical maturation occurs which slows down the outpouring of impulses. And these boys as they go along reflect in their antisocial behavior decreasing importance of impulses, that is physical impulses so that they have an inverse curve opposite to the psychopaths in their criminal careers; namely, they start at 15 or 18 as they mature, both emotionally and physically in this hypogenetic sense, and their crimes decrease. By the time they are 30 they are more or less adjusted individuals.

Interesting from a therapeutic point of view is the problem of emotional deprivation as one of the important causes of so-called psychopathic behavior in offenders. Here again is a tremendous field, but there is one thing that should be said, that when arguing against environment as the cause of psychopathy, one must remember that environment has a most specific meaning when you speak of emotional environment as derived from the parents. I recall the case of a burglar who started his criminal career at 6 in a reform school and wound up at 32 with life imprisonment under the Baumes law in New York, as a persistent felony offender. He showed emotional deprivation of a severe kind and that factor, without any organic changes or history of any sort, is to us of great significance, especially as it points toward some hope for therapy.

DR. JOHN CHORNYAK (Pittsburgh, Pa.).—With reference to intellectual inefficiency, we didn't mean to take any of these points and say they are specific for this. Intellectual inefficiency is best seen in a pre-schizophrenic as Babcock's work has shown. As to emotional deprivation, that again is the experience of every psychiatrist, but we get an occasional case that bursts our theory. So far I've been very fortunate. I have two cases, a boy and a girl, that as far as clinical, psychiatric, non-orthodox psychoanalytic methods can determine show absolutely no emotional deprivation and yet manifest the extreme picture.

With reference to Dr. Bond's statement, he has the upper hand because he knows the factors I've been developing. I have no dogmatic set ideas, as I indicated in the paper, what has been presented is absolutely a theory; but I think it is more than a hypothesis. I don't call it a hypothesis; I am definitely convinced as to its being a theory.

Now as to Dr. Childers' remarks, a Goodenough test in adults has been used in schizophrenics, and during shock therapy there have been reports of the disorganization of the body schema, with a favorable outlook if there is an integration of the body schema. Now people who have been artists, who have taken shock therapy, being schizophrenic have found that they can't make a drawing of a man without a model but do much better and almost up to their technical ability if looking at a model. So the test does apply to adults to a great extent. As to prognosis if treated, Dr. Healy has

flatly come out both verbally and in print to the effect that the prognosis for treatment in this type is extremely hopeless.

Respecting the kinds of homes these cases come from, again I refer to the two cases that come from excellent homes as far as ordinary clinical methods can determine such a situation. As to Dr. Childers' comment regarding girls and boys, I am afraid that I disagree as far as my own experience goes; which reminds one of the Hindu description of the four blind men being told to examine the elephant and tell what they saw. Our experience has been more with girls than with boys. As to age, it is true as the discussant said, egocentricity is normally present during childhood. According to Piaget, who I think has done the best work on normal egocentricity, we find the egocentricity peak is at about 3; it starts dropping off between 3 and 8; most children then lose it and begin at least identifying with siblings before puberty. The most significant change in egocentricity comes around 8, but it is a gradual phenomenon. Undoubtedly, however, there must be delays of all kinds; and there must be children whose peak of egocentricity is not 3, but 8, and who do not start losing it until puberty. We see sado-masochism in normal children, children who later develop perfectly well, but at this early age we likewise see egocentricity. That is, the child is a primitive animal, just as a psychopathic personality is, and there is a very close correlation between psychopathic personality, a child during the egocentric phase, and what the cultural anthropologists report on some primitive peoples who also have this type of personality. The whole thing is very closely linked up with Starch's discussion of nature's thinking in schizophrenia.

I would like to draw attention to one point of view which has struck me in court. I have been trained to stress treatment, to look on the hopeful side; on the other hand, I have also had the opportunity with Dr. Healy, to go over the follow-up, the 20 or 25 year follow-up of these cases; and I wonder whether we're doing our duty to society to stress treatment when literally thousands of dollars have been spent on those cases, which have been followed only to end up in the electric chair. I think we must be honest with clinics and agencies and not stress treatment when we can't offer much in return for the money and effort expended. Just as the rest of medicine recognizes inoperable carcinoma, and nobody feels disgraced by it, so I think we in psychiatry must learn to face those things that we can't treat.

RORSCHACH STUDIES IN ACUTE EXPERIMENTAL ALCOHOLIC INTOXICATION.*

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AND

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Since 1921, when Hermann Rorschach¹⁴ first published his method for personality evaluation and psychodiagnosis, numerous studies have been made in attempts to validate his findings and to enlarge the scope and application of the method. Rorschach's findings were purely empirical, based on years of careful testing, and his method included only those criteria which had been found to be of value to the method. During the past few years new scoring categories and interpretive methods have been suggested by various authors, and the Rorschach method has been amplified in various ways. Most of these changes or additions to the original technique have been theoretical although at present certain studies are being carried out in an endeavor to confirm their value.

To date, however, almost all Rorschach studies have attempted either to validate empirically the method in part or as a whole, or to discover certain combinations of responses which empirically were found to fit certain personality patterns either normal or psychopathological. It seemed, therefore, expedient to attack the problem from an experimental point of view in an attempt to validate the method and to prove or disprove some of its concepts from a purely laboratory point of view. This study, accordingly, has been designed to consider solely the problem of acute mild alcoholic intoxication in an experimental situation as reflected in the Rorschach method. It was felt that this type of experiment would validate certain of the Rorschach scoring categories in an observable clinical situation and verify or refute some of the present interpretative assumptions for the method.

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PROCEDURE.

For the purposes of this study it was essential that all subjects be tested at a specific level of alcoholic intoxication, and it was desirable that they be definitely influenced by the alcohol yet be not too intoxicated to cooperate. The level used was that of acute mild alcoholic intoxication with moderate psychological impairment. A complete description of this stage has been presented in another communication⁵ and for the present purposes it is sufficient to state that moderate psychological impairment indicates that the individual through the ingestion of alcohol has reached a state wherein he is mildly euphoric, has a general sense of warmth and well-being, feels some slight thickening in the head without any dizziness, is perhaps overtalkative and shows no somatic symptoms of any type except in some cases a transitory rise in pulse rate and, or, respiration, a facial flush, and he feels conscious of having "had a drink." The subject will also present an occasional slip in speech, slight gait abnormalities and slight swaying in the Romberg test. These criteria are objectively observable and are sufficiently accurate for use as a level of intoxication.

The Nagle Alcohol Susceptibility Test* was used to predict the amount of alcohol necessary, with a patient at basal conditions, to produce this desired stage of intoxication.

For the determination of the amount of ethyl alcohol in the blood the method of Abel¹ was employed exactly as described in his paper.

The manner of administration of the Rorschach method was essentially that described by Klopfer.⁶ Inquiries were made in the customary manner, but no "testing of the limits" was done because it would, if done in the first test, influence the second Rorschach which was given only 40 minutes later, and if done during the last Rorschach inquiry, this extra testing could not be used in comparison with the first Rorschach in which no testing had been done. The scoring of the responses was worked out according to the methods laid out by Klopfer and Davidson⁸ in their scoring folder.

*The skin test was made exactly as indicated by Nagle's^{9, 10} revised specifications, and the findings were evaluated and interpreted in accordance with the modifications suggested by Kelley and Barrera.⁵

Interpretations of the Rorschach were made in accordance with the theory and technique of Rorschach interpretation as outlined by Klopfer ⁷ in collaboration with Buchard, Kelley and Miale.

For the purpose of the experiment, while interpretations were made, it was found that simple scoring and the production of graphs for the pre and post alcoholic Rorschachs was sufficient to delineate the varying changes resulting from alcohol. For this reason no interpretative results are given except in the discussion and here only those elements which showed change are taken up from the psychological viewpoint.

EXPERIMENTAL PROCEDURE.

To carry out the experiment the following routine was employed :

1. Skin test.
2. Alcoholic history.
3. Check performance on "symptoms."
4. Read skin test at 25 minutes.
5. Rorschach number 1. (Pre-alcohol Rorschach.)
6. Give alcohol.
7. Check symptoms at 10, 20, 30, 40 minutes.
8. Blood alcohol at 40 minutes.
9. Rorschach number 2. (Alcohol Rorschach.)
10. Second blood alcohol on Rorschach completion.
11. Check somatic and residual symptoms.

Subjects were selected from volunteers, who were workers in the hospital. All were in about the same intellectual bracket.

The subject was brought into the examining room usually about 9 in the morning and immediately given a skin test. He was required to abstain from alcoholic beverages during the preceding twenty-four hours and from taking anything by mouth since 12 midnight, in order to assure, in so far as it could be controlled, an absolute "basal" condition of his gastro-intestinal tract so that the absorption rate of the alcohol would at least not be affected by the presence of food or other content in the stomach and intestine. Next the various symptoms, as given in the outline above, were checked so that the subject's performance abilities in each clinical test without alcohol should be known, and a history of his alcoholic

consumption and social reactions was taken. Fourth, at 25 minutes, the skin test readings were made, following which the first Rorschach test was given. The Rorschach was given exactly in the manner indicated above except that individuals who were familiar with the method or who had taken the test before were told that the number of answers given need not necessarily be large as an excessive number of answers contributed nothing to the experiment. This warning has been used by numerous investigators, but is usually given after the subject begins if it seems that he will go on at interminable length picking out minute and varied details. In no cases has it been found to change the effect of the Rorschach, and it was only used here with individuals thoroughly familiar with the method who might tend to give a large number of answers culled from other tests. It was suggested that they merely give those answers that first occurred to them without qualification and to endeavor to take the test exactly as though they had never previously been exposed to the cards.

After the Rorschach test was completed, the estimated dose of alcohol was given in the form of absolute 100 per cent U.S.P. alcohol diluted with an equal amount of grape juice, the alcoholic dosage being computed from the skin test evaluation. The dose, therefore, varied with each individual dependent upon the skin reaction and in most cases the desired level was almost exactly reached.

Following the ingestion of the alcohol the individual was checked against the symptom chart at intervals of 10, 20, 30 and 40 minutes. Each of the symptoms was checked at these periods, and in addition at the 30 minute level, when impairment most frequently became observable, special tests such as the reading of the additional paragraphs or the working of simple mathematical problems, etc., were introduced.

At 40 minutes, immediately following the clinical test routine, a first blood alcohol specimen was taken. The blood alcohol was taken at this particular time because the work of Miles showed that in concentrated doses approximately the peak of the alcoholic level was reached at about this period. There is a stage at which the blood content will for a time remain about stationary at the high level it has reached, and preliminary experiments showed that this stage was usually reached with the given dosage in 50 per cent

dilution at about 40 minutes. This stage is called the "Grehaut plateau," and it was desired that the individual be tested with the Rorschach method while he was as much as possible at this highest level which usually represents the period of most toxic effects and observable psychological symptoms. The more acute clinical signs occur during the early parts of the plateau and the blood alcohol estimations showed that all the patients were at this level during the second Rorschach study.

The blood for determination of alcoholic content was taken from the veins of the antecubital fossa and while skin sterilization was done using alcohol, every precaution was taken that the skin was wiped dry, and free of alcohol which could contaminate or affect the final reading. Every sample was taken and studied in duplicate.

Immediately following the collection of the blood specimen, the second Rorschach test was given. The conditions for this test were exactly similar to the preceding one, except that the subject was told that he would probably see many of the same forms that he had seen previously, in which case he was not to struggle against them but to merely give them if he so desired. It is to be emphasized here that the subject was in no way influenced to repeat his previous responses, but this possibility was mentioned because some subjects felt that inasmuch as they had given one Rorschach only 40 minutes previously, they should endeavor in the second one to give totally new and different responses. Were this the case it is quite possible that the individual would concentrate particularly upon smaller details and less obvious responses. With this slight warning, however, it was found that the individual started the test much in the same frame of mind as though he had never taken it, and usually the first several answers were given very rapidly and were essentially similar to those given before.

As soon as the second Rorschach was completed, a clinical behavior estimation and check of symptoms was made, following which the second blood alcohol was taken in the same manner as the first. The blood alcohols were taken in this sequence, bracketing the second Rorschach test between them, so that the alcoholic level of the subject could be adequately determined for the period during which the test was given. A final check on the somatic and residual symptoms was then made and the experiment was considered terminated.

RESULTS.

In presenting the results and discussion of the Rorschach findings in this experiment it seems advisable, for two reasons, to consider both the results and their evaluations together. First the numerical values extractable from a given set of records are probably only limited by the ingenuity of the experimenter, and since many of the Rorschach classifications must be considered only as tentative, it appears best to limit the study to those which to date have proven fruitful. The figures to be compiled even with these limitations are, however, most plentiful and a section presenting only the experimental results would be but a maze of data which would have to be repeated in the ensuing discussion.

Secondly, even though the use of so many tables and statistical techniques makes the Rorschach method appear reducible to mathematical analysis, it must be borne in mind that such numerical evaluations are at best only general indicators, and that each record must be judged solely on its own findings. This is true, of course, of any clinical diagnostic procedure in any medical field, and these purely clinical methods can never in any case approach true statistical standardization, because of their dependency upon the acuity of the diagnostician in developing complete flexibility in their use. This, however, does not detract in any way from their value, and, indeed these unstandardizable procedures actually form the basis of modern clinical medical practice. From this viewpoint, therefore, actual cut and dried standardization of any type is not feasible. The Rorschach method is too comprehensive and embraces too many variables, significant in the whole constellation depicting personality patterns, but of almost no value when taken alone, ever to permit of its use as a tabular diagnostic technique. Every item must necessarily be considered, not with arbitrary standards, but as fragments of a composite structure which can be put together to form a pattern which may then be interpreted to reveal the fundamental personality of the subject. The production of such a finished clinical evaluation is not dependent to any great degree upon standardized figures, but is a result of the ability, the deftness, the finesse and the clinical experience with which the administrator takes his record, summarizes his results and formulates his conclusions. Such tabular methods as are used therefore require concomitant discussion to prevent erroneous over-evaluation.

The material used for this analysis originally consisted of 38 records, that is, two records for each subject. Six cases were excluded because the desired blood level and concomitant psychological impairment were not exactly reached. Three more cases were omitted because the Rorschach record revealed the subject to be somewhat more neurotic than could be considered normal. Of course the reactions to alcohol in these cases as mirrored in the Rorschach responses are extremely interesting, but serve for the present only to confuse the findings of the normal cases. There are then 10 cases or 20 records left for analysis. Throughout each table the pre-alcoholic test will be indicated by an (S)—sober, and the alcoholic one by an (A).

One further caution should be interjected at this point, so that no misevaluations of the material may occur. It is well known among Rorschach experts that the scoring techniques, while fairly standardized, still show some definite variations from group to group. In scoring these records the general methods of Klopfer were used, and the works of Oberholzer,¹⁴ Rickers-Ovsiankina,¹² Beck,² and of course Rorschach¹⁴ were consulted. There are, however, in any large number of responses, a few which can be contested. This variance in scoring makes little or no difference in the interpretation of an individual record, for it is overshadowed by the whole configuration and its nuances can also be taken into complete consideration. In compiling comparative tables, however, using a number of records, such variations can play a large part, especially if the questionable response happens to be the only one of its type arising in a particular group. It must again be emphasized therefore that the following tabulations can only be taken to indicate general trends and not at all as definite specific "signs" of alcoholic intoxication. The small sample of cases also inclines one to this consideration, and therefore only those trends which seem moderately constant throughout will be emphasized.

The factors first to be considered are the total number (R) and time (T) of the responses. Table I shows the findings of the twenty records in these two categories.

From this tabulation we see that the total number of responses is increased in all but two cases, but that the increase in most instances is not great. Little specific significance can be attached to the (R) since ordinary variations in repeated Rorschachs are large,

and since all the cases fall within the normal range of 20 to 40 responses even after alcohol. The slight increases and decreases in the various records are also unimportant as such changes occur commonly when the Rorschach is repeated.

As regards the time of the performance (T), the total times are of little specific value to this experiment, and the time in all cases is well within the normal average of approximately one minute per response. It may be noted that in the alcohol series the times were slightly faster on the average, but this is accounted for by the

TABLE I.

	Case	1	2	3	4	5	6	7	8	9	10
Total "R"	responses										
	S	25	24	28	36	26	29	54	32	26	41
	A	27	38	32	51	30	37	49	30	39	47
Difference		+2	+14	+4	+15	+4	+8	-5	-2	+13	+6
Total time of performance second.	S	360	620	830	285	240	720	715	905	525	605
	A	260	1075	465	375	250	730	565	660	660	620
Average time per single response to nearest 0.5 second	S	14	26	30	8	9	25	13	28	20	15
	A	10	29	26	7.5	8	21	11.5	22	17	14
Difference		-4	+3	-4	-0.5	-1	-4	-1.5	-6	-3	-1

subjects' rapid repetition of previous answers. Other periods of time, *e. g.*, reaction time or the time the subject uses to give the response to the first card, and interval time, the time elapsing between the various responses to any card, were also essentially within normal limits.

The second and most important problem to be considered is the effect of mild alcoholic intoxication upon the factors indicating basic personality configuration. Rorschach coined the term "Erlebnistyp" to indicate the mutual relations of the movement and color answers. It represents the individuals "psycho-experience type" ("reaction-range" of Piotrowski or "experience balance" of Beck) and is equal to the number of kinæsthetic or movement

answers in proportion to the number of color answers. Movement (M) is indicative of creative instinct and power, and predominates in introverted types. Color (FC, CF, or C) is indicative of behavior and attitudes toward the outside world and predominates in extraversion. Rorschach made a type of classification based on the ratio balance of these two determinants and described three main types, introversive, extratensive and coerced or tending to constriction. The proportion between the two determinants is called $M : \Sigma C$, or $M : \text{Sum C}$. Sum C is the sum of the total color responses and answers according to the formula: $FC=0.5$, $CF=1.0$ and $C=1.5$. M is always equal to 1.

The above general personality values of the two factors have been verified by numerous workers.^{11, 8} As Beck points out, however, "we cannot at all times interpret the same Rorschach factor as having precisely the same personality value. The differences are in some instances minor; in some rather great, as for example the excess use of colors signifying overactivity in the feeble-minded or the 'artistic' temperament in the superior healthy adult. But a closer scrutiny of all the personality values of any one of the factors shows these differences to be differences only in respect to their social values. There is an identity of psychological process which is finding expression."

In addition to the general quotient M to Sum C, two other quotients have been found to depict this relationship. These are: (1) the ratio of the $(FM+m)$ to $(Fc+c+C')$ and (2) the proportion of responses to cards VIII, IX and X. Let us examine our results in the light of these three categories.

Table II gives the ratios and proportions of these three quotients as calculated from the records. Individual figures for each type of response are omitted because they add no additional information and require an excessive amount of tabular space.

In order to clarify our observations which at this juncture seem somewhat obscured by the rapidly accumulating mass of figures, let us reduce the numbers to simple statements indicating the different trends of the reaction-range. After all, the proportions are merely signs pointing toward one side or the other of the reaction-range. All these trends are therefore indicated on Table III so that their relationships may be more easily grasped. They indicate the change

in the subject's personality configuration after alcoholic ingestion during the accompanying moderate psychological impairment as compared to their normal state. The changes in form per cent (F per cent) are also included.

In this table the decreases or increases of the form per cent with alcohol are shown in the second column. The M: Sum C column shows the trend of change in the basic reaction-range, and the next column shows the same trend as indicated by the ratio (FM+m): (Fc+c+C').

The last column shows this trend either to M or Sum C as computed from the per cent responses in cards VIII, IX, and X.

TABLE II.

RATIO M TO SUM C.

Case	1	2	3	4	5	6	7	8	9	10
S ...	7:1	4:15	3:1	11:2.5	3:4.5	3:8.5	11: 8.5	3:6	2:3.0	8:3
A ...	8:1.5	5: 5.5	4:2	12:3	3:8	3:7.5	7:13.5	5:6	2:7.5	10:2.5

RATIO (FM + m) TO (Fc + c + C').

S ...	2:2	5:0	5:4	4:5	2:3	2:3	8:4	6:2	8:7	8:7
A ...	0:3	3:5	5:6	9:7	2:3	3:6	13:4	5:2	5:7	9:4

PERCENTAGE OF TOTAL RESPONSES OCCURRING IN CARDS VIII, IX, X.

S ...	48	43.5	35.8	41.6	42.3	52.6	40.8	40.6	46.1	41.5
A ...	33.2	32.2	40.6	41.2	43.4	54.0	40.8	46.6	56.5	32.0

For this group in all cases except number 3 before alcohol, and in all cases with alcohol, the trend was definite, and an M in the column indicates a per cent of 30 or lower and a C indicates a per cent of 40 or higher. If the second Rorschach showed an increase in an original trend it is indicated by a plus (+) as in case 8: C to C+.

In order to make use of the facts thus far assembled it is now necessary to survey the clinical condition of the subjects. As has been pointed out all were essentially on the same level of clinical impairment from an objective point of view, *i. e.*, all showed about the same degree of impairment in walking and turning, mild Romberg, definite though slight speech impairment, flushing of the face, alcoholic breath and mild mental retardation.

In studying the subjective reactions of these cases, however, one is struck by immediate variations. By subjective reactions are meant the feelings of remoteness, mental retardation or difficulty in thinking, sense of effort in concentration, and a feeling of change

TABLE III.

Form, Case, per cent.	M: Sum C.	(FM+m): (Fc+c+C').	Per cent response in cards VIII-X.
1 Dropped ..	From M to M but slight increase in C	From O toward C..	From C to M
2 Dropped ..	From M to C.....	From M toward C..	From C to M
3 Dropped ..	From M to M but marked increase in C	From M toward C..	From Average to C
4 Dropped ..	From M to M with slight increase in C	From C toward M..	(No change) C
5 Dropped ..	From C to C with marked increase in C	No change	(No change) C
6 Increased..	From C to C but relative increase in M	From M toward M (increase to M)	(No change) C
7 Dropped ..	From M to C.....	From M toward M (increase in M)	(No change) C
8 Increased..	From C to C but relative increase in M	From M toward M (relative increase in C)	From C to C+
9 Increased..	From C to C and marked increase in C	From M toward C	From C to C+
10 Increased..	From M to M and increase in M	From M toward M (increase in M)	C to M

in emotional tone such as a marked euphoria or a "don't care what happens" attitude. It should be pointed out that all the subjects had transitory feelings of well-being and mild euphoria which occurred within five to ten minutes after ingestion of the alcohol. Following this initial emotional elevation, the effect seemed to wear off and the subjects felt that they were becoming sober.

About 30 minutes after taking the alcohol, the subjects all began to show objective signs which persisted for about another 40 minutes, and it was during this period that the second Rorschach was taken. During this interval the subjective reactions as indicated above were variable, it being remembered that all the cases showed the same objective signs and the subjects can be arranged, therefore, into four categories as follows:

1. Those admitting little or no subjective sensations except to state that they "felt good," and who from their conversation and reactions were obviously not trying to make any effort to control or hide their emotional feelings.
2. The cases who also showed little or no subjective sensations but who admitted to definite conscious effort to keep themselves under control and who admitted that under "social conditions" they would probably "feel the drinks more." This type of case was definitely affected by the "experimental environment" and was unable to let go. With effort the subjective symptoms were completely controlled, but definite and admitted effort was necessary.
3. Those cases who admittedly felt definite effects as enumerated above and who accepted them without any effort to "pull themselves together."
4. Those cases who admittedly felt definite subjective effects in spite of the fact that admitted conscious effort was used in an attempt to overcome them.

Here then are two large groups, those who admitted almost no subjective effects, and those who did, and each of these two groups is composed of two types, those who accepted their feelings without effort and those who were unable to relax and enjoy the situation, and who made a definite and conscious effort to control their subjective sensations throughout the critical period. The cases can be placed in these categories as follows:

TABLE IV.

Slight subjective effects.		Marked subjective effects.	
Without conscious effort.	With conscious effort.	Without conscious effort.	In spite of conscious effort.
2 - 5 - 1	10	3	4 - 6 - 7 - 8 - 9

From this arrangement it can be seen that over half of the subjects had marked effects and that one case ¹⁰ though admitting

only to feeling good, also required marked mental effort to fight off feelings of remoteness, etc. The alcoholic habits of the subjects are of interest here in that all, except number 4, who used effort in an endeavor to overcome their feelings, were moderate drinkers with some experience. This is especially true of case 10, who was one of the two heaviest drinkers of the group. Those who used little or no effort included cases 4 and 5, who were almost teetotalers and 1 and 2 who were only mild occasional drinkers. This observation is in accord with Bowman's⁴ findings and indicates that attempts at mental control of the subjective symptoms are probably to a large degree born of practice.

By using the above arrangement of the cases, a systematic comparison of the Rorschach variations can now be made and is shown in Table V.

This table is essentially a rearrangement of the preceding one so that the clinical types can be compared. All the symbols are similar and the arrangement is identical. Two more columns have been added at the extreme right. The one headed "space" indicates the change in white space answers under alcohol. All space answers were increased and the figures given represent this amount of increase in the second Rorschach. The column headed animal per cent indicates the variation in total animal per cent ($A + Ad$). In all but two cases (4 and 10 which increased), the per cent dropped in the second Rorschach.

From a study of this table we may postulate certain general psychological trends which develop during the state of acute mild psychological impairment as mirrored by the Rorschach responses.

1. As regards the Form per cent (F per cent), it appears that the cases which showed an increase in F per cent all showed clinically, attempts at control of the subjective symptoms. Also, in these cases the trend in the personality configuration was toward the M side with little or no change in the factors on the C side. In only one (case 9) does this assumption break down and in this individual there was an unusually low M total to begin with, and though control was attempted, the C factors basically predominated and the individual was overwhelmed by environmental relationships. This reaction will be more clearly seen as the discussion continues. The F per cent then apparently indicates, or is the result of, the use of control in attempting to balance the reaction-range. This is

TABLE V.

SLIGHT SUBJECTIVE EFFECTS.									
WITHOUT CONSCIOUS CONTROL.									
Case.	Form per cent.	M: Sum C.	(FM+m): (Fc+c+C').	Per cent R in cards VIII-X.	Space answers.	Animal per cent.			
1	-	M to M..... (Slight increase in Sum C)	O toward Sum C	Sum C to M	3	-			
2	-	M to Sum C..	M toward Sum C	Sum C to M	3	-			
5	-	Sum C to Sum C (Marked increase in C)	Toward Sum C (No change)	Sum C.....	1	-			
10	+	M to M.....	M toward M..	Sum C to M	3	+			
DEFINITE SUBJECTIVE EFFECTS.									
WITH CONSCIOUS ATTEMPT AT CONTROL.									
3	-	M to M..... (Marked increase in C)	M toward Sum C	Average to C	0	-			
4	-	M to M.....	Sum C toward M	Sum C..... (No change)	1	+			
6	+	Sum C to Sum C	M toward M.. (Increase in M)	Sum C..... (No change)	1	-			
7	-	M to Sum C..	M toward M.. (Increase in M)	Sum C..... (No change)	0	-			
8	+	Sum C to Sum C (Relative increase in M)	M toward M..	Sum C to Sum C (Increase in C)	0	-			
9	+	Sum C to Sum C (Marked increase in C)	M toward Sum C	Sum C to Sum C (Increase in C)	0	-			

borne out in other types of Rorschach work and tends to verify the position of the Form category midway between the M and C areas in the personality graph. The F interpretations are also the most inconsequential and least individual responses in the indication of mental attitudes although they may be original in perceptual content and occur in abnormal numbers in pedantic and constricted cases.

With a drop in F the trend in all cases is toward the C, and it seems evident that as the reactions of an individual become more influenced by the environment, personal control is reduced.

It is not feasible to prepare charts giving the per cents of F+, F, and F- as to date no truly accurate method of evaluating these categories has been produced. It is essential of course for individual case interpretation to work out the F+ per cent to avoid erroneous conclusions about an increasing F per cent. In cases 6, 8, and 10, the F+ per cent, as well as the total F per cent increased, showing control as described above, but in case 9, the F increase can be considered as a misrepresentation in that the F+ per cent actually dropped in the second Rorschach as an effect of the alcohol. It is apparent therefore that the F+ per cent estimation is even more important than the simple summation of the total F per cent. About the only method to date offering accurate results along this line is to set up a comparative scheme for F+, F and F- based on the answers within any given record. This works ideally for single cases, but, since the evaluations of the clarity of perception are in a large part dependent on the interpreter, statistical comparisons among different experts are most difficult. The careful analysis of each F answer in the individual records, leaves no doubt, however, that in every case the forms were poorer or on a more "popular" or crude level in the Rorschach taken during alcoholic impairment. This would fit in with the loss of careful discrimination common to the intoxicated states, and also be in agreement with the great mass of psychological experimental data accumulated by workers in this field tending to show a decrease in the intellectual achievements of intoxicated subjects, even of those with only a slight psychological impairment.

2. In studying the M:Sum C ratio, the relationship to the F per cent has been given. In general it can be said that unless marked attempts at control are made the trend will be in the

direction of Sum C with an increase in the number of responses to color. If the balance is already in favor of Sum C, it will continue with alcohol, unless definite mental effort is made to overcome the subjective effects.

3. In the ratio $(FM+m)$ to $(Fc+c+C')$ the results are quite definite. All the cases without effort regardless of the presence or absence of subjective effects showed a trend toward Sum C or, in one case, a continuation of the already established trend in this direction. All the cases wherein conscious effort was applied showed a trend toward M or the increase of these factors if already predominating. The only exception was case 9, who made some effort as shown by increasing F per cent but an unsuccessful one as shown by a drop in her $F+$ per cent and who clinically was emotionally so overwhelmed by the psychological impairment that she became abnormally susceptible to environmental influences. She had marked subjective symptoms, was utterly unable to control them and gave up completely throwing herself wide open to stimuli from without. This individual clinically showed an inability to adjust to her surroundings and under alcohol became very suggestible and tractable, yet withal confused and at odds with her strong inclination to react to external stimuli. She, herself, was quite aware of this effect and never took more than one drink when drinking socially.

From the above results we may assume that this quotient represents the conscious control of an individual in attempting to stave off an increasing trend toward environmental reactivity if the $(FM+m)$ is augmented, and a relaxation of such control if the $(Fc+c+C')$ side is increased. It would seem, therefore, justified to consider these factors as indicative of the attempts of an individual to regulate emotional responses to the environment. It is also possible to assume that this shift towards M in addition to indicating control, could point toward a basic increase in the introverted factors with an increasing tendency to release deeper forces and drives. At this level of intoxication of course there is no true release of unconscious material such as occurs in some individuals during more complete intoxication, but the feelings engendered in the individual of such portending release, indicated by the increase in FM and m, may be one of the principal causes of the specific attempts at voluntary control.

4. The per cent of responses to cards VIII, IX, and X seems to show a definite relation to the factors $(FM+m)$ and $(Fc+c+C')$. In all the cases which did not show subjective effects, but did show changes in these two factors, the trend was definitely from Sum C to M. (Case 5 showed no change in $(FM+m)$ $(Fc+c+C')$ and consequently no change here.)

All the cases with subjective effects either showed no change in the per cent of responses to cards VIII, IX, and X, the per cents being maintained at levels of about 40, or they were actually raised to this level. The cases showing the least control of symptoms, without, or in spite of effort, were 3, 8, and 9, and these all showed the greatest increase in this quotient.

We may hypothesize on the basis of these findings that this quotient seems to act as a balance, probably unconscious, in cases without subjective effects, which attempts to maintain customary environmental relationship, in the face of shifts in the $(FM+m)$ and $(Fc+c+C')$ factors brought about by conscious control. Here the original personality configuration has shifted, and this quotient tends to counteract such changes. In cases unable to control their feelings, with or without effort, the trend towards Sum C can be taken to indicate further the decreasing ability of this group to handle adequately emotional reactions to the environment and a loss of the normal balancing action represented by this ratio. This quotient then actually seems to indicate the type of unconscious reaction of an individual to his environment in a specific situation, and shifts as the situation or environmental influences are changed. If this proportion tends toward less than 30 per cent it seems to indicate a trend towards withdrawal from the present external situational forces, and if over 40 per cent it represents a tendency towards being markedly affected or even overwhelmed by the environmental conditions. It does not seem to be under conscious control but rather appears to reflect subconscious or unconscious reaction trends.

These assumptions based on such a small series of cases cannot in any sense be considered as final. The fact, that they exactly follow the clinical observations, however, is definite and important support in their favor. We may postulate from this phase of the experiment that in acute mild alcoholic intoxication, before deep stages are reached, drinkers are of two types; those who relax

and accept their emotional feelings and subjective symptoms, and those who, for one reason or another struggle against them. In either group subjective symptoms may or may not develop at a given level of intoxication as determined purely by objective clinical means. In individuals who attempt to fight off their symptoms, the predominant personality pattern shift is toward the introversive side. These are the people who when mildly intoxicated are careful of what they say and do, and cautious in their reactions to outside stimuli. Individuals who relax and accept the situation show an extraversion trend and are more friendly and are more affected by their environment.

From the Rorschach findings it seems reasonable to assume that the $M:Sum\ C$ quotient represents the fundamental personality pattern, and as it shifts, so shifts the personality as observed clinically regardless of the other two factors. The $(FM+m)$ to $(Fc+c+C')$ quotient seems to indicate the presence or absence of conscious effort to control a threatened personality shift. If this control is sufficiently powerful the anticipated trend towards increased reactivity to external stimuli with alcohol may be reversed and a trend towards introversion set up. This would explain certain clinical types of drinkers and the development at this level of intoxication in certain people of increasing introverted traits. The third quotient (per cent R in cards VIII, IX, and X) seems to act more as a balance to maintain the original personality pattern in the face of other intrinsic changes and indicates in those cases whose control attempts are insufficient, the development of subjective symptoms and foretells a trend towards increasing emotional reactivity to stimuli from without and a loss of voluntary control.

Two other response totals add to the validity of these assumptions. The white space answers which have been considered as trends towards negativism in general occur in the majority in the group showing no subjective symptoms. It is reasonable to assume that since most people on comparatively large doses of alcohol would at an objectively demonstrable level of impairment present some definite symptoms available on introspection, these particular subjects probably inherently react somewhat differently from the rest. It is especially interesting that case 10, showed the greatest struggle towards being overcome and possessed so many responses

of this type. This type of adverse reactivity does not appear to be conscious but seems to represent an unconscious tendency to react to stimulation in a manner different from the usual individual. Only two cases in the group presenting subjective symptoms showed this type of response and these were the two who reacted with the strongest endeavor to fight the effects.

The second accessory factor is the animal per cent (A per cent). In all cases but two, this per cent dropped in the second Rorschach. It is most interesting that, in the two cases who made the strongest struggle against subjective effects, one successfully (10) and one unsuccessfully (4), this A per cent indicative of stereotypy should increase to the point where the A per cent equaled the F per cent (case 10) or even went above it (case 4). It would seem that these two subjects in their efforts to control their subjective feelings narrowed down their content range to a marked degree. This rigidity in control is borne out by their clinical attitude and evident desire not to be affected by their feelings of increasing susceptibility to environmental stimuli.

In concluding this discussion on the three quotients of the *Erlebnistyp*, it should be mentioned that in all cases, except with marked control the trend is toward Sum C, regardless of the original personality configurations. For this reason it seems reasonable to believe that at this level of moderate psychological impairment, the personality in general merely becomes somewhat more susceptible to external stimuli, and that the inherent personality does not become released nor are inner drives freed unless the subject already possesses predominant trends in extraversion directions. In other words this level of intoxication may produce one of four effects.

1. Extraverted types may become more outgoing.
2. Introverted types may be made to appear extraverted.
3. Extraverted types may shift slightly towards introversion tendencies.
4. Introversion types may become more introverted.

The first two results occur when no effort is made to fight the feelings engendered by the alcohol and strong attempts at controlling these effects produce the latter two. These general types of reaction are well known in any social gathering but the Rorschach findings throw some light on the mechanisms involved.

Finally it should be definitely stated that a Rorschach study of a subject does not offer as yet any method of predicting the type of reaction which will be followed. Clinical observations before testing are equally as useless. Apparently the only way to determine which of the protean psychiatric effects will be produced by alcoholic ingestion in a given individual is actually to try him with the drug.

As regards the Rorschach findings in the various other categories, the figures are too few to permit any but the most hypothetical assumptions.

The intellectual aspects of the alcoholic Rorschach records are slightly poorer in that the form per cent tends to be lower, the good form answers are fewer and an increasing number of poor and vague forms are seen. Also, the character of the answers as a whole is in general on a less complex level and the movement and color perceptions are less accurate. The approach and per cent of P and O answers, however, remain almost unchanged. This would be expected since the Rorschach records were taken at an interval of only 40 minutes and the approach in the second invariably was similar to the first. P answers are given in about the same proportion, and O answers in the first Rorschach are retained in the second. Under intoxication very few O answers are added, an expected finding in view of the impaired intellectual capacities.

As regards the diffuse shading responses, K, k, and FK, little variation is shown at this level of impairment and no conclusions can be drawn.

The movement responses have been previously tabulated in the M:Sum C table and their changes indicated. It should be mentioned that at this level of intoxication, the records do not show any remarkable increase in immature responses (FM) which would have indicated a trend toward infantilism. In considering this point, however, the increase or retention of the total M answers is significant. The general pattern of the Rorschach taken during alcoholic intoxication is in many ways similar to the picture found in mild states of psychotic excitement. In these patients the M is best construed as representing egocentric wish fulfillment rather than an introversive trend in the sense of an inner creative activity which it does in healthy, normal adults. It may signify the same sort of thing in alcoholics, or in combination with the FM and the

reaction-range shift towards Sum C accompanied by increased CF, C, and poor form responses, it may point to the regression of the alcoholic to a lower, more infantile level, and here the M would represent some type of phantasy living. This idea is purely theoretical, of course, in the absence of a general increase in the FM and m responses, and can only be considered as a suggestion pointing to an understanding of the apparent clinical regression in chronic alcoholics. This trend although characteristic of the personalities of chronic drinkers was not manifested clinically in the experimental subjects, so the lack of such manifest signs in the Rorschach is to be anticipated.

In the color ranges, the trend is toward color, and at least three cases showed an increase of C/F responses. These responses have been assumed to indicate an attempt to hide intellectual confusion and such an indication seems evident in these cases. Increased CF according to Rorschach represents impulsiveness indicating one who does not care for adaptability, also it represents affective suggestibility. The increase of this element in some of the cases is in complete accord with the clinical data. In addition the use of color description, color symbolism and color naming was increased, indicating the marked reactivity to outside stimuli reached in these cases. This reaction is obvious clinically, all the subjects showing increased interest in their surroundings and increased reactions to simple stimuli such as excessive laughter to simple jokes, etc.

Some care must be used to prevent over-evaluation of the color reactions as Schuly¹⁵ in 1916 found that small doses of alcohol increased the acuteness of vision both for red and green. This may account in part for the presence of the pathological sign of color naming (Cn) present in half the cases in the second Rorschach. This sign is common in organic and schizophrenic cases and may indicate some sort of early cortical disorganization as an effect of alcohol on the central nervous system.

The only other significant findings are in the Fc responses and the areas of location. The Fc answers increased in all cases except number 5 which remained unchanged, and number 7 and 10 in each of which there was a drop of two Fc responses. If this factor can be assumed to indicate a cautious awareness of events going on in the environment as a means of protection against insecurity, the general increase would correlate well with the increased color

responses and would agree exactly with the clinical feelings of the subjects.

As regards the various areas of response used, the only conclusions which can be drawn are that in general all the details are increased but in no definite proportions and that the Dd are somewhat emphasized. This is quite in accord with the clinical observations that the subjects were more attracted by tiny details of the environment during the impairment stage than when sober and that they were less able to reason abstractly.

The space answers have been discussed previously, and all were increased in those subjects who clinically tended to show definite negativistic trends during the experiment as shown by statements that they "weren't a bit impaired" even in the face of obvious clinical effects, or by statements like "you can't find out anything about me," "don't horn in on my conversation," or argumentative attitude. S answers did not occur in the other cases who showed no such negativism, and it would seem that the general assumption of the interpretative value for this response is definitely supported by the experimental results.

In concluding the findings of this experiment it should be emphasized that the Rorschach pattern of every case closely paralleled the clinical observations. This is important, for in the experiment a definite artificial shift of the personality was achieved in some of the cases, and this shift was accurately mirrored in the Rorschach responses. The experiment then definitely indicates the validity of the method and its flexibility in reflecting early clinical changes in personality pattern. In addition it shows to some degree how the "inner mechanisms" work as indicated in the study of the reaction-range or *Erlebnistyp*. For these reasons it seems reasonable to conclude that the Rorschach method is a valid indicator of induced personality shifts which are clinically corroborated, and further that it measures very fine changes of the personality configurations such as are clinically observed at the level of moderate psychological impairment produced by acute mild alcoholic intoxication.

It should be added that while the conclusive results are most important in contributing both to our knowledge of the Rorschach test and in validating certain of its empirical findings in a controlled clinical test, no specific Rorschach signs and no specific Rorschach pattern that are pathognomonic for or even indicative of this state

of alcoholic impairment have been found. The general Rorschach picture with its slight increase in M, its shift to Sum C, its increase in poor form and decrease in F per cent, and its crude color responses, simulates a mild state of excitement, and is not at all specific for acute mild alcoholism. Further studies could be carried out in deeper states of intoxication, but preliminary trials of this type indicate that the picture presented above is merely magnified.

The Rorschach test also fails to give as definite indications of the psychological level of intoxication as do the clinical and biochemical studies and is of little value to the clinician in the specific field of mild alcoholic intoxication as a diagnostic tool. It does, however, reveal some of the mechanisms of the clinical reactions and is of considerable use as a research adjunct.

SUMMARY.

1. The Rorschach findings in ten cases of acute mild alcoholic intoxication at a predetermined clinical level are given.

2. Rorschach findings at this level are experimentally shown to validate certain previous theoretical or empirical findings as regards the M : Sum C ratio, F per cent, Fc, S, CF, C naming and description, and theories are advanced regarding the evaluation of the $(FM+m) : (Fc+c+C')$ and per cent answers in VII, IX, X, quotients.

3. The validation of the Rorschach method in its reflection of experimentally induced personality shifts as indicated clinically is shown.

4. No Rorschach findings of pathognomonic diagnostic value for this level of alcoholic intoxication are found, and no specific "Rorschach pattern" can be described for the diagnosis of acute mild alcoholic intoxication.

5. Personality shifts occurring at this level of intoxication are described and correlated with shifts in the Rorschach response patterns.

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THE INTERNAL ENVIRONMENT AND BEHAVIOR.

PART III. WATER CONTENT.

By EDWARD F. ADOLPH.*

Claude Bernard (1878, p. 114) declared: "In animals having free existence there necessarily exists a group of arrangements regulating the losses and the gains in a manner that maintains the quantity of necessary water in the internal medium." That statement expresses in qualitative terms the rule that adjustments of water content of the animal body are relations between losses of water and gains of water. I have recently attempted to obtain, for man and dog, quantitative data from which these relations may be described.

Exchanges of Water in Water Excesses.—For experimental purposes, a man or dog as ordinarily observed in the laboratory is in water balance. Water content is increased by the planned ingestion of diverse amounts of water (data of Kingsley). Thereafter very many physiological quantities are different from what they were; among them the losses and the gains of water by the body as a whole are first chosen for measurement. The body weight, made excessive by the ingestion, decreases as time goes on, and much more rapidly than without the ingestion. After a lag, the rate of loss is approximately proportional to the excess of water (or positive *load*) present in the body. Rates are greatest at 1 to 1½ hours, and after 3 to 4 hours nearly all the load has been eliminated. Most of the unusual loss is accounted for as urine.

Choosing to compare the rates of water exchange either in the first one hour or the second one hour after water is drunk, it is found that rates of loss are greater as loads are greater. Simultaneously, rates of gain of water are very small, being limited to that water formed by oxidative metabolism. Load itself may be thought of as a stimulus, and rate of exchange then answers the definition of a response. The response is one that actually accomplishes recovery of water content. It increases the output of water in urine, modifying activities of more tissues than just the kidneys.

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Exchanges of Water in Water Deficits.—In other tests, water content is diminished. Some tests are carried out by consuming only dry foods for 1 to 4 days, hence by partial privation of water intake. In other tests on man the water content is depleted by intense sweating incident to walking for an hour or two in the hot desert, in which period 2 to 4 per cent of the body weight is lost (Adolph and Dill, '38). At a predetermined moment the subjects are allowed to drink water at will. At first they take water rapidly, later much more slowly; and during half an hour much less water is consumed in man than had been previously lost. There is just significantly faster intake in the summer desert as compared with the winter-laboratory. In any one test the intake in relation to time follows a regular course corresponding roughly to an exponential equation.

Initial rates of intake are related to initial deficits of water that prevail, in both man and dog (Fig. 1). Regression of rates upon these negative water loads indicates approximate proportionality, but the proportion of the deficit taken in an hour or less is much smaller in man than in dog. This marked diversity between the two species is far outside of any individual variations, and has not yet been related with any better-known feature of mammalian economy.

Adjustment of Water Content by Gain and Loss.—The two sorts of water load, excess and deficit, may be compared graphically with loads as abscissæ and initial rates of exchange as ordinates (Adolph, '37). Two curves result, one for loss and one for gain. When loss is rapid, gain is slow, and vice versa. The two curves cross in one point, gain equalling loss, which is water *balance*. The point is located at the only water content that is steadily maintained (zero load). At all other water contents initial losses exceed gains, or vice versa. This means a *net* loss (or gain), and the direction of exchange is apparently appropriate to restoration of the original water content.

Intake and output are thus compared in common dimensions. So far as I can judge, adjustments of deficits and of excesses are equally accurate. Output is a physiological behavior exhibited in the continuous flow of urinary water and of evaporative water. Intake is a physiological behavior exhibited in intermittent swallowing and more continuous absorption and distribution of water. If

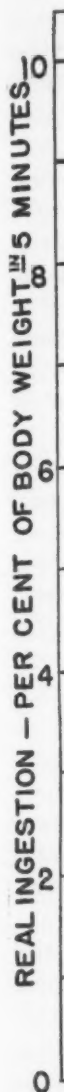


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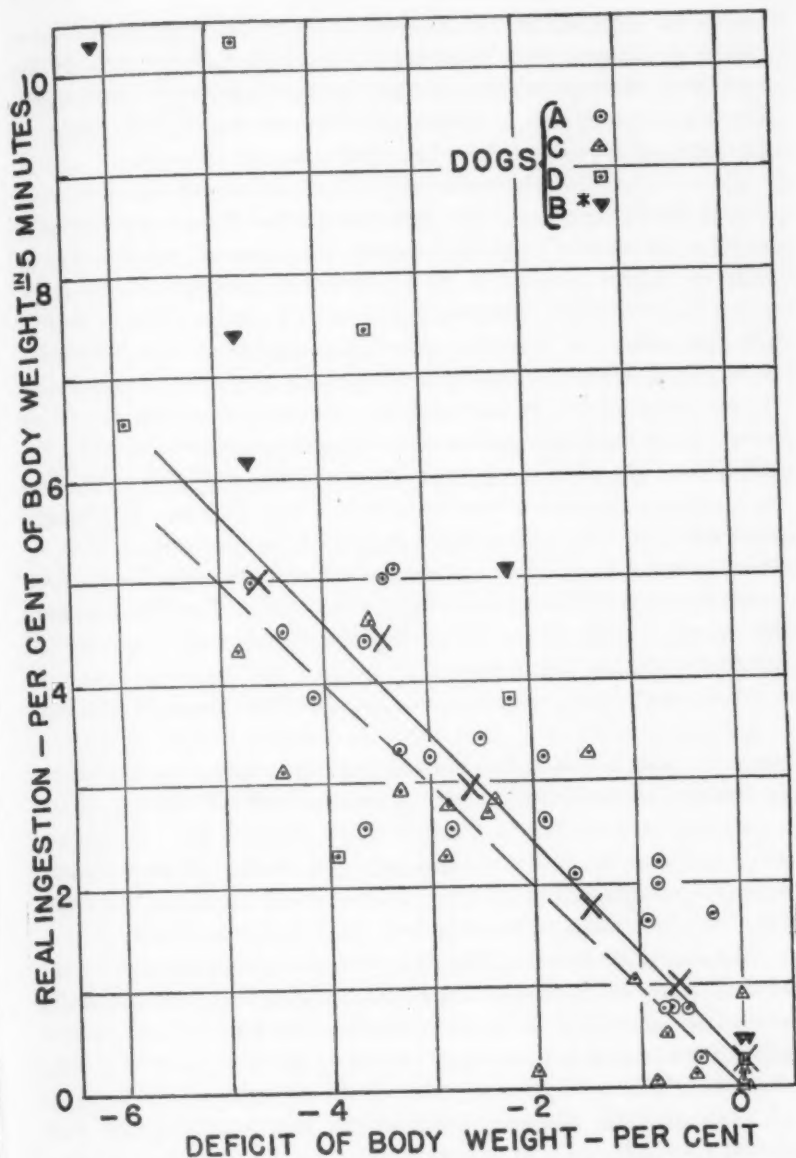


FIG. 1.—Amounts of water drunk by dogs at the end of water privations that produced diverse deficits of water content. Each test is indicated, and every eight tests taken in order of abscissæ are averaged (X) except for those of dog B* in which an esophageal fistula was reconnected by a tube (from Adolph, '39).

the term behavior be not limited to activities involving known neural structures, then behavior as observed at both ends of the course of water metabolism is concerned in restoring water content. Or, maintenance and restoration of water content of the body, of the internal environment, *is* behavior.

Some Possible Intermediaries.—Observations of the sort mentioned above raise questions concerning what tissues are employed in those activities. In water excesses the increased urine output or diuresis might be dictated by one or many changes in the body. (1) Complete denervation of the kidneys in dogs does not modify the time relations or precise quantity of urine excreted (Klisiecki *et al.*, '33). Hence, whatever messages are employed in controlling output need no nerves in this part of their transmission. (2) It is now certain that during diuresis in dogs the plasma is diluted. The dilution of the plasma may then be a message in itself. This dilution appears about one-third hour before any diuresis. (3) Special chemical messengers have been sought. Augmented output of something from adrenal glands, and suppressed output of something from hypophysis have been widely suspected, but neither seems to be demonstrated. These three hypotheses represent the sorts of inference that are being tested.

Water deficits are said to be accompanied by "thirst." This term is commonly used in at least three meanings: (a) a physiological *state* that may be easily defined as a negative water load. An animal is "subjected to thirst" when it is deprived of water. (b) A *sensation*, as set forth by Cannon ('18) that, so far, is known to exist only in man, for no means has been devised of identifying it in any sensory element of other animals. (c) An *urge* or craving, that may be studied by finding how much water is drunk.

The last definition can be put to test, and particularly strikingly in dogs with fistula of the esophagus. Water that was drunk then gained no access to the body, and the drinking could be quantitatively measured without long dispelling the urge to drink. Such dogs were rendered poor in water to diverse extents while on diet of uniform daily amount; body weight was a measure of water deficit (Adolph, '39). It was found that on the average the rate of sham-drinking was proportional to the weight deficit (Fig. 2). Hence the urge called thirst is closely correlated with the state called thirst.

The esophageal fistulous dog could also be supplied by stomach (Bellows, '39) with the exact amount of water required to dispel its deficit. This water did not pass through the mouth. If allowed access to water at once the dog sham-drunk an equal quantity. After 10 minutes less was drunk, and if forced to wait 15 minutes or more, no water was drunk. This time was presumably required for water in the stomach to accomplish some specific effect, possibly while being absorbed from the gut. Bellows has also shown (new data) that water in the amount of the water deficit, given by stomach tube to a non-fistulous dog is likewise followed by duplicate drinking of the whole amount. The dog has now obtained twice the amount of water craved, for the first water administered did not register on its way to the stomach. This demonstrates two separable factors; one temporary, of passage of water through mouth and esophagus, the other lasting, after water reaches the stomach.

Thirst is one of many urges that seem to be indispensable for successful survival, but for which no sense organs, neural pathways (Bellows and Van Wagenen, '39), or other structures are identified. Functions that have no known anatomical basis need not be ignored on that account. The suggestion (Cannon, '18) that the throat is one site of origin of sensations of thirst has been widely discussed.

Some Other Behaviors in Water Excesses.—It seems appropriate to mention a few further specific types of overt behavior that are exhibited when water loads are increased. Achelis ('30), measuring the excitability to electrical stimuli in cutaneous nerves, found that after adding water to the body the chronaxie temporarily increased. Larger excesses of water have occasionally been produced in men for various experimental or supposedly therapeutic purposes, and a series of manifestations has been observed in these extreme states, *e.g.*, muscular twitchings, headache, dizziness, restlessness, chills, nausea, vomiting, diarrhea, dyspnea, asthenia, cramps, sweating, positive Babinski reflexes, incoordination of movements, stupor, unconsciousness, dilatation of the pupils, opisthotonus, convulsions and death. Most were seen in two surgical patients who through error received 8 liters of water by rectum within 30 hours (Helwig *et al.*, '35, '38). To the physician these phenomena are symptoms of an unusual state of the human body. They are also to

be regarded as responses to this internal state. Intensities and frequencies of each such response need to be precisely measured in relation to water content. Certain of the activities, notably vomiting, diarrhea, dyspnea, and sweating, actually relieve the body of some of its excess of water. It seems arbitrary to say which of the responses are advantageous to the subject while others are unavoidable consequences. Rather, all are part of a syndrome sometimes termed "water intoxication" from which very commonly recovery occurs. All are behaviors characteristically exhibited by men with unusual, high excesses of water content. It is supposed (Rowntree, '26) that intracranial pressure is greater than usual in this state.

The most likely exception to utility in the responses is the urge to drink more water, found by Regnier ('16) and Kunstmann ('33). After consuming about 10 liters of water daily for 8 to 127 days, drinking became an obsession. The subjects often awoke at night and felt impelled to get out of bed in order to drink. Salt was also craved and the mouth was dry, possible indications of inadequate use and distribution of the excess of water already present in the body. Patients having meningioma with high intracranial pressure are generally relieved of symptoms by drinking large volumes of water.

In the uncommon pathological state of diabetes insipidus, men exhibit modified behaviors toward water; the rates of intake and output of water are greatly augmented. It is not known whether a net excess or deficit of water prevails during it as compared with the average water content of normal individuals. When an excess of water is suddenly administered, it is not all promptly excreted (Findley and White, '37). The urge to drink water is overwhelming, yet water taken is lost more rapidly than usual. If the steady loss is retarded by administrations of hypophysial extracts, excessive intake and output of water are usually completely inhibited.

Diverse types of organic and functional nervous disease are characterized by aberrant rates of adjustment of water content. It is also known that faster excretion of water may be induced by suggestion during hypnosis (Hoff and Wermer, '26). Water exchanges respond to conditioned stimuli (Marx, '35). This may mean that adjustments of water content though once imperfect, may be capable of reestablishment and training.

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Behaviors in Water Deficits.—States of water deficit may be equally productive of special behaviors. A train of manifestations was described by King (1878) from observations upon a troop of cavalry lost for 4 days in the Texas desert: inability to swallow, dimness of vision, deafness, vertigo, delirium, incoordination of movement, emotional irritability, and hallucinations of feasting and drinking. Food is often refused. The flow of saliva in response to an adequate stimulus is greatly diminished. Restlessness and mental confusion are the rule (McGee, '06). The lone traveler who has run short of water in the desert raves, casts off his clothing, and rushes onward kicking his obsessive but empty water-can ahead of him. Even here it is not possible to judge which of the behaviors are inappropriate to recovery of water content. All are responses correlated with particular deficits of water content; precise measurement of each of them is highly desirable.

Investigators often use the "thirst drive" to increase the intensity or frequency or rate at which various acts are performed, in rats, cats, dogs, and I hope in man. I suggest that the drive or urge be measured in quantitative units, either of the amount of water subsequently consumed *ad libitum*, or of the negative water load with which it is correlated (Figs. 1 and 2). For the latter, it is only necessary to ascertain the shortage of body weight that prevails when the tests are made. Further, a standard type of deficit may be produced by water deprivation upon an otherwise standard diet, rather than many types of deficit by a variety of exposures, drugs and unknowns.

Summary.—Internal environment and overt behavior present a reciprocal relation, for the constancy of the body's composition and function depends on behavior for its maintenance, and behavior in turn depends on the body's contents and physiological states. With respect to water, elimination of excesses and replacement of shortages are symmetrical aspects of recoveries and adjustments of water content. Each is quantitatively related to the other in a kinetic pattern that is but rarely incomplete, even in diseased states.

Bernard said (1878, p. 113): "The fixity of the internal medium presupposes an arrangement in the organism such that the variations are at each instant compensated and equilibrated." This arrangement I have tried to describe.

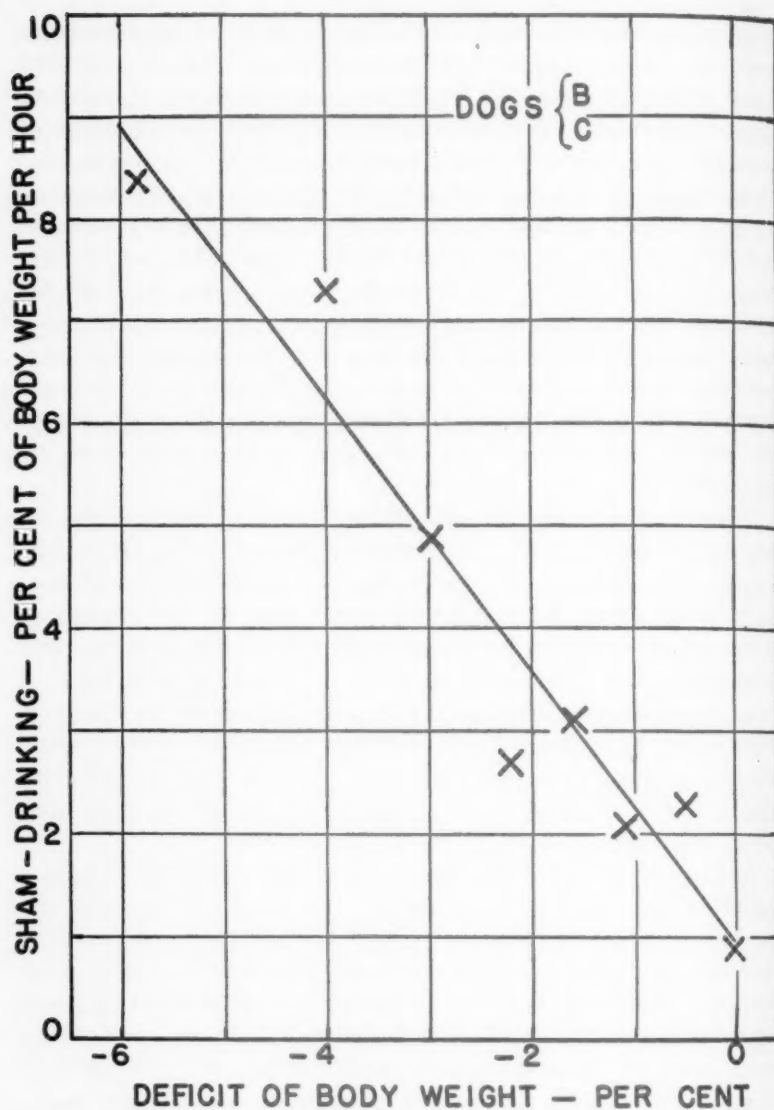


FIG. 2.—Amounts of water sham-drunk by dogs during steady deficits of water content. Each point represents the average of 12 tests of 24 hours each, taken in order of abscissæ (from Adolph, '39).

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THE INTERNAL ENVIRONMENT AND BEHAVIOR.

PART IV. CARBON DIOXIDE AND ACID-BASE BALANCE.

By NATHAN W. SHOCK.*†

The term acid-base balance, or acid-base equilibrium, refers to the chemical state resulting from a balance between anions and cations in the body. A complete characterization of the acid-base balance of the blood, for instance, would require a complete chemical analysis of all the anions and cations present. However, it has been found experimentally that the acid-base equilibrium may be described accurately enough for most purposes in terms of the pH and the bicarbonate content, the latter representing the excess of base over acids other than carbonic. The first unified explanation of the physiological and physicochemical mechanisms by which the body maintains its normal acid-base balance appeared in monographs and papers of L. J. Henderson,^{35, 36, 37, 38} whose researches have shown the functional relationship existing in the blood between pH, bicarbonate content and CO₂ tension, as well as other anions and cations present in the blood stream. These studies have been enlarged upon and extended by Van Slyke and his co-workers and are beautifully summarized by Peters and Van Slyke.⁶⁷

On the basis of the mathematical relationship between pH bicarbonate and CO₂ tension, a system of coordinates is possible which is useful in bringing out in sharp relief the physiological mechanisms involved in the regulation of the acid-base equilibrium of the body. Fig. 1 illustrates this system of coordinates. The vertical lines, whose coordinates run across the bottom of the figure, represent constant pH values, running from 7.10 to 7.70. Values

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for constant bicarbonate content of the serum run from upper left to the lower right-hand corner of the figure, with the values shown along the left-hand side of the figure, running from 15.0 to 50.0 mM/liter. Constant CO_2 tension lines run from the upper right-hand corner of the figure to the lower left with values from 21.8 to 85 mm.Hg. as shown on the right-hand side of the figure. For instance, all points along the line marked 40 in Fig. 1 will

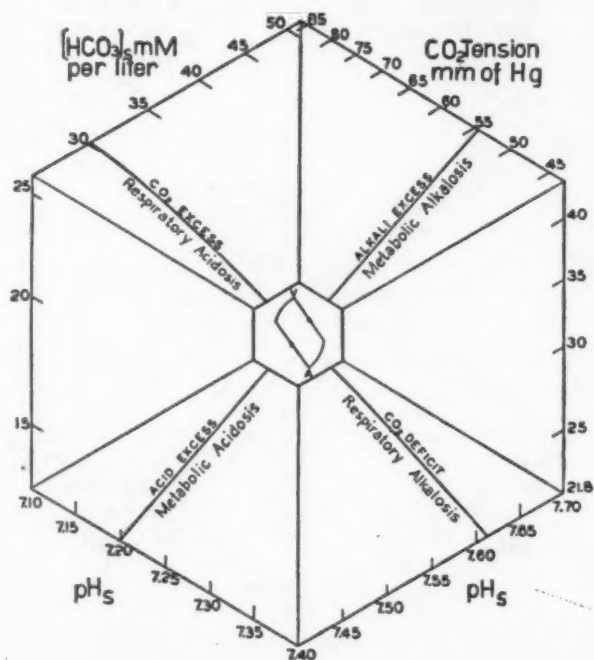


FIG. 1.—Acid-base areas of displacement.

have a CO_2 tension of 40 mm.Hg., although the pH and BHCO_3 values will vary.

From a series of experiments on normal individuals (Shock and Hastings⁷⁶) it was found that displacements of the acid-base equilibrium by the addition of fixed acids or alkali produced displacements of the acid-base equilibrium along the line labeled "acid excess" or "alkali excess," while respiratory changes by rebreathing, or hyperventilation, produced displacements along the line labeled " CO_2 excess" and " CO_2 deficit." In this system of coordinates, respiratory displacements in acid-base equilibrium are at right

angles to metabolic displacements produced by the ingestion of acid or alkali (see Fig. 1). Since changes in acid and alkali other than CO_2 represent metabolic displacements which can be removed only by way of the kidneys, it is possible to assess the relative metabolic and respiratory effects of any displacement of acid-base equilibrium when plotted on such a chart. For example, the changes in acid-base equilibrium, which take place throughout the normal respiratory cycle, are shown within the normal area of Fig. 1.

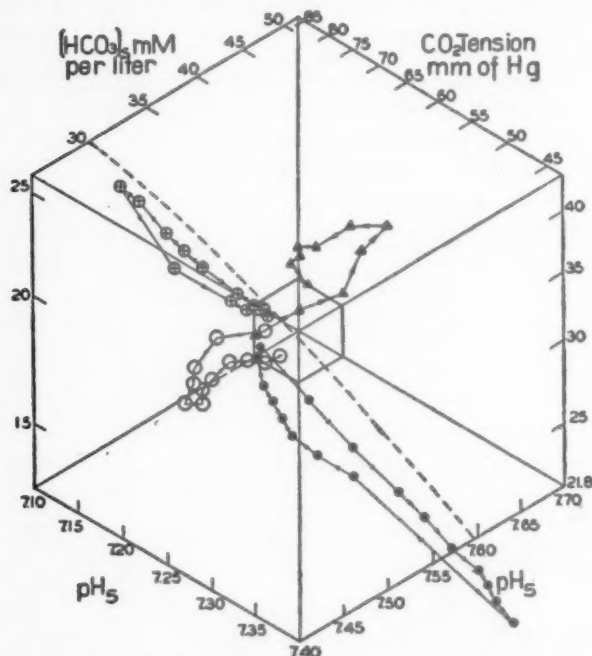


FIG. 2.—Paths of acid-base displacement of blood in normal human.

▲ Determination at half-hour intervals following oral ingestion of 20 g. NaHCO_3 ; ○ Determinations at half-hour intervals following oral ingestion of 15 g. NH_4Cl ; ● Determinations at 1-minute intervals during hyperventilation and recovery; ⊕ Determinations at 1-minute intervals during rebreathing oxygen without removal of CO_2 and recovery.

If we start with the point V as venous blood we see that on oxygenation in the lung there is a loss of CO_2 with a decrease in CO_2 tension accompanied by a slight decrease in the bicarbonate content and a shift toward the acid side, as indicated by point A. In the tissues the opposite effect occurs. Fig. 2 indicates the direction of displacements of acid-base equilibrium which may be produced experimentally (see legend of Fig. 2 for experimental conditions). The metabolic displacements produced by ingestion of sodium bicarbonate or ammonium chloride occur relatively slowly, since the points determined

(shown as \blacktriangle in Fig. 2) were taken at half-hour intervals. On the contrary, respiratory alterations are produced much more rapidly, as shown by the points in the rebreathing and hyperventilating experiments which are taken at one minute intervals. Fig. 3 indicates the effect of superimposing respiratory shifts on metabolic shifts, and further illustrates the independence of the two mechanisms.

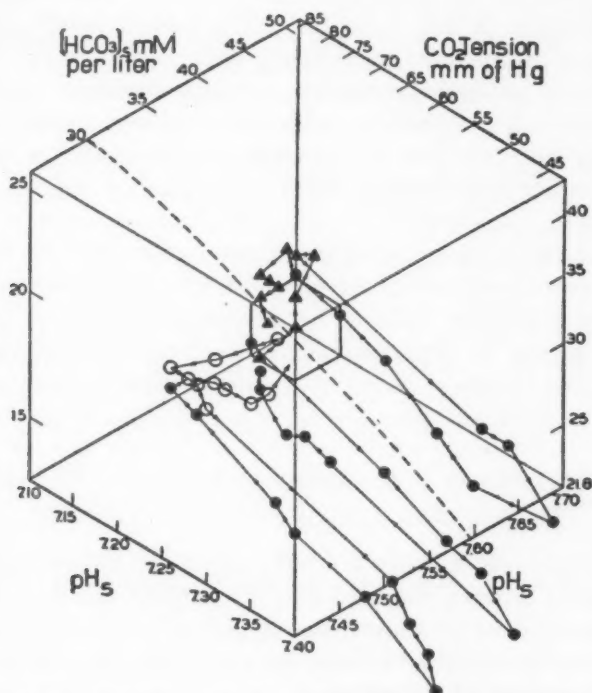


FIG. 3.—Paths of acid-base displacement of blood in normal human. Shows effect of combining metabolic and respiratory displacements. Legend same as Fig. 2.

The belief that acid-base equilibrium may have some very important bearing on behavior originates from the clinical observation of two behavioral extremes: first, coma, as observed in the extreme acidosis of diabetes and nephritis, in which the nervous system does not respond to any stimuli; and second, tetany, as observed in conditions of increased pH, from hyperventilation or from vomiting in pyloric obstruction, where the nervous system responds indiscriminately and with maximum motor response to almost

any internal or external stimulus. From the results of experimental and clinical studies it was thought that extreme deviation in the pH of the blood was the causative factor in these extremes in behavior.

It is our present aim to discuss the correlation of behavior with displacement of the acid-base balance into the areas outside the small hexagon of Fig. 1, within which normal variations occur. Since our information, particularly with respect to behavior, is most scanty and non-quantitative, such boundaries as can be indicated will lack the precision with which we can characterize the acid-base equilibrium itself. In many of the studies we will have to be content with guesses about the extent of displacement in the acid-base equilibrium in terms of what we know about the effects of the physiological displacement applied, since no measurements were made on the blood itself. Furthermore, two quite different conditions need to be considered: first, the behavior during a phase of experimentally induced acid-base abnormality; second, the behavior during the period following re-adjustment to such an abnormality.

ALTERATIONS OF BEHAVIOR ASSOCIATED WITH METABOLIC DISPLACEMENTS OF ACID-BASE EQUILIBRIUM

A number of investigators have attempted to demonstrate a relationship between increased alkalinity and increased excitability. In most instances determinations of pH only have been made, so that we cannot safely attribute the alteration either to metabolic or respiratory displacement.

The excitability of nerves and muscles is measured either by sensitivity to galvanic electrical stimulation (such as the so-called cathodal opening contraction) or by measurements of chronaxie. It is found that under conditions of increased alkalinity (or pH) the sensitivity of muscles or nerves to galvanic stimulation is increased. For instance, the current necessary to produce muscular contractions may decrease from normal values of 6 mA. to values of 1mA.² when the acid-base equilibrium is shifted to the alkaline side. On the contrary, some investigators report that increased alkalinity increases chronaxie (reduced excitability) while others report that it decreases chronaxie.

For instance, Fredericq^{20, 21, 22} found that lowering the pH caused a lengthening of the chronaxie of the perfused turtle heart, while H. de Waele¹⁸ and Beerens¹ found that in the frog, after an injection of an acid in the dorsal lymph sac, the chronaxies of both striated muscle and heart were shortened while the opposite effect was obtained with NaHCO_3 .

Many studies of the effects of pH on excitability of nerve or muscle are unsatisfactory, since the alteration of concentrations of other ions in these experiments produce effects that are difficult to interpret. Grant,⁸⁰ in studying the effects of solutions of Na_2HPO_4 and NaH_2PO_4 upon the excitability produced in the sciatic-gastrocnemius nerve muscle preparation of the frog, reported that changes in pH within physiological limits do not affect excitability. Binger⁴ found that phosphate solutions produce tetany in dogs when the pH of the solutions lies between pH of 6.0 and 12.4. The tetany was shown to be independent of serum Ca, but might have been related to the phosphate ion rather than to alterations in pH. Page^{61, 62} showed that either by a change in pH or by the addition of Na^+ or by both, a wide variation in physiological action may result: (1) sudden death with very few nervous manifestations by injections of H_3PO_4 ; (2) violent convulsions by injection of NaH_2PO_4 ; or (3) tetany from injections of Na_2HPO_4 and Na_3PO_4 . Thus it is impossible to separate clearly the effects of pH from the effects of other ions in these experiments. In other experiments where pH has been altered by changes in CO_2 tension, evidence for increased excitability with increased pH has been obtained (see page 1382) (Lehman,⁵¹ Hettwer⁸⁹).

Shifts of the acid-base equilibrium toward the acid side by ingestion of acidifying salts will reduce the susceptibility of animals to strychnine convulsions (Wenner and Blanchard⁸³) as well as to epileptic seizures (Lennox and Cobb⁵²). Ingestion of alkali will increase the number and severity of epileptic seizures. Injections of alkali reduce the effect of curare (Wenner and Blanchard⁸⁴), showing that a depressed nervous system is increased in sensitivity by an alkaline medium.

Wenner and Taylor⁸⁵ found that the patellar reflex time was reduced in dogs in which the pH of the blood had been lowered to 7.18-7.26 by the oral administration of NH_4Cl . They also reported decreased reflex time when the blood pH was raised to 7.74 by intravenous injections of NaHCO_3 . The decrease in reflex time with increased pH and NaHCO_3 fits in with the common conception of increased irritability, but the facilitating effect of lowered pH requires explanation. Wenner and Taylor attribute the facilitative action of lowered pH to a decrement created at the synapse or motor end plate which they believe would block out the higher cortical centers and thus account for the decreased reflex time. It is difficult to assign a physiological mechanism to produce the differential effect of blocking out higher cortical centers by a reduction of the BHCO_3 content since most studies indicate that increase in acidity results in vaso-dilation which would tend to facilitate cerebral activity (Leake, Hall and Kohler⁴⁹; Kurtz and Leake⁴⁶).

From the data available it seems that convulsive seizures of varied etiology can be minimized by reducing the alkalinity of

the blood along the metabolic axis (Fig. 1). Evidence of increased excitability with metabolic alkalosis is shown by galvanic current stimulation, although results from chronaxie measurements are contradictory.

If we now consider more complex and less readily defined behavior differences we are confronted with a number of studies and hypotheses.

Ludlom⁸⁴ reported that the excited type of insanity gave an alkaline salivary reaction together with alternating acid and alkaline condition of the urine, perspiration and feces; while the confused type of insanity gave a general acid reaction. Although this was a preliminary report on only two patients, it has been rather extensively quoted. Starr⁸¹ and Rich⁸⁹ have correlated pH determinations on saliva with behavior characteristics. Starr⁸¹ found that excitable stammerers had a high salivary pH while those designated as sub-breathers had a low pH. Since Starr showed a high correlation between alveolar CO₂ and salivary pH⁸⁰ it is quite probable that differences reported represent respiratory displacements rather than metabolic characteristics of the acid-base balance.⁸⁸ Rich⁸⁹ reports ratings of excitability correlated with salivary pH to the extent of .25 to .45 and concluded that excitable subjects tended to secrete an alkaline saliva. Rich definitely regards his correlations as representing metabolic mechanisms which may be characteristic for the individual, although it is impossible to make such a distinction between metabolic and respiratory factors when only pH values have been reported.

Hamilton and Shock⁸⁸ found correlations of only .17 between pH and CO₂ tension of the blood and introversion (Northwestern scale) and neurotic tendencies (Thurstone Inventory) on a group of 112 male college freshmen. Since the correlations found were higher for pH and CO₂ tension with the personality measures than between personality measures and bicarbonate content of the serum, Hamilton and Shock interpreted their results as indicating that the persons who were unadjusted, excitable, nervous or introverted, altered their acid-base equilibrium by respiratory changes when confronted with a new situation, such as that of anthropometric measurements or withdrawal of blood samples. Rich reported a correlation of -.30 between excitability and acidity of the urine, which he thinks lends support to his belief that excitable persons show increased alkalinity. However, it is necessary to remember that the urine is a waste product of the body which is greatly influenced by such factors as diet and activity, and consequently may or may not give an index of the acidity or alkalinity of the body itself. For

instance, Haldane³² and Palmer and Van Slyke⁶³ have demonstrated that the urine may be either more or less alkaline than the circulating blood.

The older assumption that tetany resulted when the pH attained values of 7.60-7.70 (Peters and Van Slyke,⁶⁷ Peters, Bulger, Eisenman and Lee,⁶⁸ Myers and Booher,⁶⁹ Hartmann and Smith³⁴) must be regarded with some suspicion in view of the studies of Eisele,¹⁸ who showed that patients under treatment for gastric or peptic ulcer by the alkali diet introduced by Sippy⁷⁷ did not show any symptoms of tetany even though the pH of the blood had been increased to 7.7. Furthermore, experiments by Shock and Hastings⁷⁸ on normal individuals indicated that the symptoms of tetany might occur at a pH of 7.50 when the acid-base equilibrium had previously been displaced toward the acid side by ingestion of 10 g. of ammonium chloride.

These findings raise the question of whether tetany may not be more closely related to a decrease in CO_2 tension than the increase in pH, which is usually associated with this condition. Eisele reports headaches, lassitude, nausea and vomiting as the early symptoms of clinical alkalosis. He also reports drowsiness, stupor and finally coma as the terminal phase. Before the terminal phase is reached, however, certain mental symptoms, such as increased irritability, lack of cooperation, disorientation and irrationality were found, although no tetany or muscular twitchings were ever seen. Wide individual differences in patients were found, in that some individuals can tolerate a pH of 7.73 with a bicarbonate of 48 millimols per liter without any of the clinical symptoms, while other individuals reported headache, lassitude, and increased irritability with only slight displacement of the acid-base equilibrium. It is possible that the severity of symptoms may be related to the speed with which the acid-base equilibrium is displaced; a slow rate of physiological displacement may result in less severe symptoms than rapid displacement (McFarland⁶⁸).

In another study Shock⁷⁴ found that ratings of well-being were associated with slight displacements toward the alkaline side, increased pH and bicarbonate, although no improvement in mental multiplication was found. Hoff⁴⁰ reported feelings of emotional depression both in himself and in two other cases, following the ingestion of sufficient ammonium chloride to produce a displacement in acid-base equilibrium. Similar depressing effects after NH_4Cl ingestion were reported by Haldane³² and Shock,⁷⁴ although quantitative measurements of behavior or feelings of depression are lacking.

The effect of feeding NaH_2PO_4 (which may alter the acid-base equilibrium of the blood toward the alkaline side) on mental performance has been summarized recently (Shock⁷⁵). In general some evidence for increased mental performance, particularly in children following the ingestion of Na_2HPO_4 , has appeared (Strauch,⁷⁶ Poppelreuter⁶⁸), although more experiments are needed with quantitative determinations of blood phosphate, Ca and acid-base balance.

If we are to draw any conclusions from such unsystematic data, they will be: (1) That extreme displacements in either direction along the metabolic axis will result in loss of consciousness and coma; (2) Lesser displacements toward the alkaline side tend to result in hyper-excitability on the motor side; (3) Increased acidity results in loss of consciousness and coma without evidence for stimulation; (4) The limiting values of pH in which the extremes of behavior occur are largely a matter of individual difference. The lower limit is in the vicinity of 7.15 and the upper limit is in the neighborhood of 7.65 to 7.70; (5) The characteristic sequence of symptoms may be influenced by the rate at which the displacement in acid-base equilibrium is effected.

ALTERATIONS OF BEHAVIOR ASSOCIATED WITH RESPIRATORY DISPLACEMENTS IN THE ACID-BASE EQUILIBRIUM.

Excessive elimination or retention of carbon dioxide is the physiological stimulus which produces displacement of the acid-base equilibrium along the line labeled " CO_2 excess" or " CO_2 deficit" of Fig. 1. Experimentally such changes may be induced quite readily in normal individuals either by having them hyperventilate with the resulting CO_2 deficit, or to rebreathe without absorption of CO_2 , or by the actual breathing of mixtures of air rich in carbon dioxide.

CO_2 Deficit.—Recent experiments in which the pH of the medium has been altered by changes in CO_2 tension have shown that the threshold of stimulation for mammalian nerve-muscle preparations is lowered (increased excitability) when the pH is increased by a lowering of the pCO_2 .

Lehman⁵¹ found that within the pH range of 7.2 to 7.8 the threshold for electrical excitation of mammalian nerve with induction shocks is increased (decreased excitability) when the nerve becomes acid and decreased when the nerve becomes alkaline. On the contrary, Hettwer⁵⁹ found a depressant

action of CO_2 tensions from 1.5 to 180 mm. Hg. on nerve excitability (frog). However, he used 0.0 CO_2 as his point of reference from which to measure changes in excitability.

Although evidence for increased neuro-muscular excitability is found in a lowered current necessary for galvanic stimulation,³ measurements of chronaxie in humans under conditions of CO_2 deficit produced by hyperventilation show increased values (decrease in excitability).

Bourguignon and Haldane,⁵ Bourguignon, Turpin and Guillaumin,⁶ Dijkstra,¹⁴ and Hut⁴¹ have found increased chronaxie of various muscles and nerves in humans during voluntary hyperventilation. The chronaxie values for muscle increase 2-10 fold, while those of nerve increase 10-30 fold.⁵ Recovery from effects of hyperventilation requires longer for the nerve chronaxie (40-60 minutes) than for muscle chronaxie (10-20 minutes). Increased motor chronaxies are also found in parathyroid tetany and are reduced by injections of parathormone (Parhon and Kreindler⁴⁴). On the contrary, the motor chronaxie in normal rats is not lowered by high dietary calcium and injections of parathormone (Detrick and Olmsted¹²).

These results raise the question whether an adequate index of stimulation is possible during tetany when there is already greatly increased tonus present.

The tetany which results from hyperventilation has been observed and carefully described by Haldane²² and by the classical works of Collip and Backus,⁹ and Grant and Goldman.³¹ The speed with which this displacement can be induced in normal individuals is quite rapid (Shock and Hastings,⁷⁶ Soley and Shock⁷⁸). Fig. 2 is taken from an experiment which shows that the maximum displacement with a pH of 7.60 and a CO_2 tension less than 20 mm.Hg. returns to normal within four minutes after cessation of hyperventilation. Fig. 3 illustrates similar experiments in which hyperventilation follows ingestion of acids or alkali. In these experiments tetany was observed in all cases, even though the pH was raised only to 7.50 in experiments where ammonium chloride was previously ingested. This result coupled with the report of Eisele, who found no tetany in patients even though the pH of the blood was raised to 7.60 by the administration of sodium bicarbonate, makes it appear that the low CO_2 tension rather than the increased pH may be the factor involved in the production of tetany. The same conclusion is reached by Talbott, Cobb,

Coombs, Cohn and Consolazio⁸² on the basis of acid-base determinations made on the blood of a patient suffering from hysterical hyperventilation.

Hyperventilation will precipitate epileptic seizures in many patients, although not in all.⁸³

One of the difficulties in many of the studies reported on the effects of hyperventilation on behavior and mental functions is that no adequate measurements of the extent of displacement in acid-base balance have been made. In experiments on patients it has been found that wide individual differences exist in the effectiveness of pulmonary ventilation in altering the acid-base balance of the blood.⁷⁸ For instance, patients may give the external appearance of marked hyperventilation with a respiratory volume five times the resting level without producing appreciable shifts in the acid-base balance of the blood. This frequently occurs with rapid shallow breathing.

It is frequently stated that alterations in acid-base balance of the blood does not provide a true index of the conditions in the tissues. This is probably true under conditions of rapid change, although Dusser de Barenne, Marshall, McCulloch and Nims^{15, 16, 17} have shown that the pH of the cerebral cortex follows that of the blood except when alterations in activity of the cortex occurs, such as in epileptic seizures, when its pH no longer passively reflects that of the arterial blood. Hence we may assume that although determinations of acid-base balance of tissues would be desirable, the determinations on blood are not without meaning.

When we turn to experiments on the effects of respiratory alkalosis (hyperventilation) on sensory processes, we find reports of diminished sensory acuity and increased latent periods. Increased idiosyncrasy of response to association words is also reported, as well as decreased speed in number cancellation and addition. Shock and Hastings⁷⁶ found that in respiratory alkalosis of the extent shown in Figs. 2 and 3, consciousness was definitely impaired and sensitivity to pain was reduced, since many subjects had no memory of finger punctures made when blood samples were taken during hyperventilation.

Gellhorn and Spiesman²⁷ reported a decrease in auditory sensitivity after two minutes of hyperpnoea. The decreased sensitivity persisted for five or six minutes after cessation of hyperventilation. The same authors²⁸ found a lengthening of the latent period of negative after-images or even complete absence of any after-images following five or six minutes of hyperventilation at a rate of 66 per minute. Gellhorn²⁸ found that 2 minutes of hyperpnoea produced a decrease in visual intensity discrimination. Gellhorn and Joslyn²⁸ reported a decrease in speed of number cancellation and addition after two minutes of hyperpnoea. The effectiveness of the hyperventilation in any of

these studies cannot be assessed since no values for respiratory volume, alveolar CO_2 or blood CO_2 tension were given. Gellhorn and Kraines²⁶ found an increase in the idiosyncrasy or individuality of the responses made to the Kent-Rosanoff association words following two minutes of breathing at the rate of 35 per minute. Some criticism has been made²⁶ of the method of determining the "usualness" of the responses. Bentley² obtained similar results by having his subjects take a sip of colored water just prior to giving his response to the association word. Thus the association between CO_2 or O_2 tension in the central nervous system and "unusualness" of the response is questionable.

Since similar effects are reported by the same authors²³⁻²⁸ when 6 per cent CO_2 is breathed, resulting in a respiratory acidosis (Fig. 1) it is highly questionable whether the results can be attributed to alterations in the CO_2 tension. Gellhorn²⁴ interprets the similarity of the effects of oxygen lack and CO_2 deficit as evidence that the total effect can be attributed to oxygen lack in the central nervous system, since it has been shown that marked vaso-constriction of the cerebral cortex results from hyperventilation (Cobb and Fremont-Smith,⁸ Wolff and Lennox⁸⁶). However the same explanation cannot be offered for the similar effects produced by 6 per cent CO_2 excess since CO_2 in this concentration is an effective vaso-dilator of brain capillaries.⁸⁶ Bentley² has suggested that the results of Gellhorn and his co-workers might be explained on the basis of inadequate control of the psychological aspects of the experimental situation.

Because of the speed of respiratory adjustments (see Figs. 2 and 3) extreme respiratory alkalosis or acidosis is not apt to be maintained continuously for long periods of time. However, certain behavior and psychological characteristics occur in patients with anxiety states, in whom many of the physical symptoms, such as cardiac palpitation, nausea, sense of suffocation, gastric pain, etc., can be attributed to the periodic hyperventilation which is frequently associated with anxiety (Kerr, Dalton and Gliebe⁴³; Kerr, Gliebe, Soley and Shock⁴⁴; Soley and Shock⁷⁶).

A relation between anxiety states and hyperventilation is also indicated in the findings of Rich⁶⁹ and Hamilton and Shock⁸⁸ (see page 1380). The conception that diminished sensitivity of the respiratory center is associated with dementia præcox may also prove to be nothing more than a persistence of hyperventilation, since Golla, Mann and Marsh²⁹ and Marsh⁸⁶ found that while normal subjects doubled their respiratory volume when they breathed

2 per cent CO_2 in air, dementia præcox patients showed no respiratory augmentation. This conception is further supported by the findings of Mann and Marsh⁵⁵ that the alkaline reserve of dementia præcox patients is normal.

In conclusion we may say that hyperventilation definitely results in increased motor excitability, as shown by increased sensitivity to galvanic stimulation and tetany. Sensory thresholds are probably increased. Thus we see peripheral motor stimulation (tetany) with impaired consciousness resulting from either increase in pH or diminution in CO_2 tension.

CO_2 Excess.—The narcotic action of high CO_2 tension on nerve and muscle has long been known.^{49, 62} Furthermore, increased concentration of CO_2 in the neighborhood of 20 per cent in inspired air will produce narcosis and may, in fact, be used for surgical anæsthesia in animals (Leake and Waters⁵⁰). Gellhorn^{28, 28} reports that breathing 6 per cent CO_2 results in the lengthened latent period for after-images, with decrease in visual intensity discrimination and a decrease in auditory sensitivity (see page 1384). On the other hand, Shock and Hastings found that in rebreathing experiments with normal individuals in whom the concentration of CO_2 in the inspired air reached 9 to 10 per cent, reported increased sensitivity to pain. Hence it appears that somewhere between 10 and 20 per cent carbon dioxide the narcotic action becomes appreciable. Since changes in acid-base equilibrium induced by increased CO_2 tension take place with considerable rapidity (see Fig. 2, where the points are at one minute intervals), such a displacement is usually transitory in nature and is not maintained over extended periods of time. Carbon dioxide is an effective vaso-dilator of the cerebral vessels, and most investigators have attempted to relate the effect of increased CO_2 tension to the increased oxygenation of the cerebral cortex.

Epileptic seizures are reduced by inhalation of 6 to 8 per cent CO_2 .⁵² McQuarrie and Ziegler⁵⁹ found that increased CO_2 in the inspired air (15 per cent) increased the blood sugar level in dogs and tended to inhibit insulin convulsions. The mechanism whereby high levels of CO_2 in the inspired air increase blood sugar levels is unknown.

From the work of Loevenhart, Lorenz and Waters⁵⁸ and others,^{11, 42, 46, 47, 48} it has been considered that carbon dioxide in high concentrations may act as a cerebral stimulant, since acute

catatonic schizophrenia patients were found to show intervals of lucidity after the administration of 20 to 40 per cent carbon dioxide.

Unfortunately, no determinations of the acid-base equilibrium in humans have been made after the administration of such high concentrations of CO_2 ; hence most of our discussions must be on the level of conjecture. On the basis of the rapid recovery after breathing 10 per cent CO_2 shown by the normal individuals in the experiments of Shock and Hastings,⁷⁶ it is problematical whether the displacement in acid-base equilibrium would extend beyond the period of hyperpnea, resulting from high concentrations of CO_2 administered. Examination of these experiments by various authors^{11, 42, 46, 47} indicates that the periods of lucidity in the schizophrenic patients may extend as long as 10 to 15 minutes after the hyperpnea has subsided. Unless schizophrenic patients are quite atypical in regard to their acid-base equilibrium one would suppose that the mental stimulation occurs after the CO_2 displacement has been practically readjusted. Hence it is questionable whether the cerebral stimulation obtained can be attributed to alterations in the acid-base balance. Paterson and Richter⁶⁵ found that 25-30 per cent CO_2 in the inspired air alleviated the catalepsy produced in monkeys by injections of bulbocapnine.

Experiments by d'Elseaux and Solomon¹¹ lend support to the conception that it is not the CO_2 concentration itself which is the effect of stimulus, but rather any intense stimulus which the patient regards as a threat to himself, since they found that cerebral stimulation can be produced by anoxia and by large doses of sodium bicarbonate. Although it is possible that the anoxia and the increased CO_2 tension had a lowered pH as a common factor, it is difficult to use the same principle of explanation for the effects of bicarbonate and increased body temperature produced by diathermy, as reported by these authors. It is still possible, although improbable, that even though the pH and bicarbonate content of the blood were increased by the administration of alkali, the interior of the cells in the cortex were at a low pH.

SUMMARY OF STATEMENTS.

Fig. 4 attempts to summarize the behavior manifestations of alterations in the acid-base balance. It is apparent that displacements beyond relatively restricted areas will result in loss of consciousness and impaired mental functions. From the data at hand it is possible to make a rough estimate as to the boundary limits of consciousness with respect to both pH and CO_2 tension, although

in none of the experimental data has it been possible to ferret out any indications as to the limits in bicarbonate content which are compatible with consciousness. The limits of pH seem to be somewhere between 7.15 and 7.60, while $p\text{CO}_2$ may vary between 25 mm. and 85 mm.Hg. before continuous loss of consciousness occurs. Tetany or increased peripheral motor reactivity seems to be definitely associated with lowered CO_2 tension, since increased

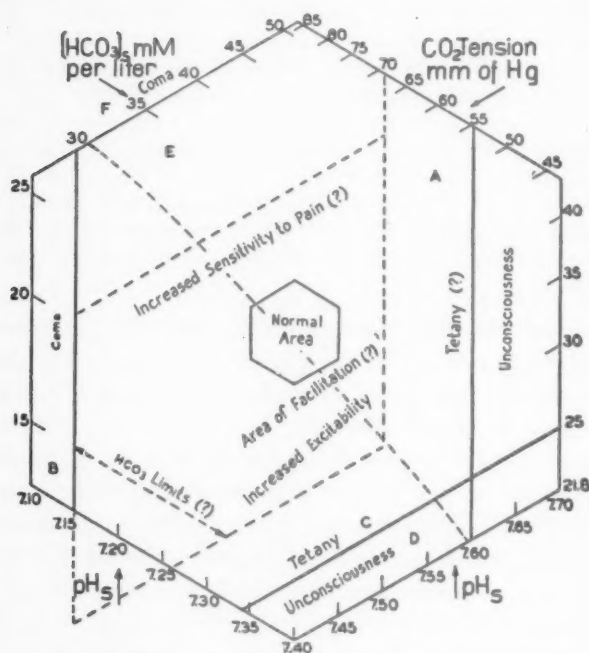


FIG. 4.—Behavior correlates of acid-base displacement.

pH values have been found in the absence of tetany (A, Fig. 4, where pH rises to 7.60 without tetany). On the other hand, an increase of pH and a rise in CO_2 tension have as their end result, coma, without the manifestations of tetany. It is possible that an increase in CO_2 tension up to the extent of producing maximal cerebral vaso-dilation may result in hypersensitivity and reactivity, although control observations have not been made. Similarly, the early effects of decreased CO_2 tension may be reflected in the diminution of oxygen available as a result of vaso-constriction.

However, the end results of both high and low CO_2 tension cannot be entirely attributed to alteration in oxygenation.

POSSIBLE MODES OF ACTION.

1. *Alterations in Calcium.*—The question of whether tetany is the result of lowered calcium ion concentration or reduced hydrogen ion concentration has been investigated by many workers, and the results are summarized by Peters and Van Slyke⁶⁷ and Schmidt and Greenberg.⁷⁸ The results of these studies indicate that tetany is produced by a decrease in the concentration of either hydrogen ion or calcium in excess of that bound by protein, and is relieved by procedures which increase either the hydrogen ion concentration or active calcium ion concentration in the serum. The difficulties in adequate methods for determining the concentration of ionized calcium was a definite handicap in earlier studies in which total calcium was determined. With the development of more sensitive methods of separating and estimating ionized calcium, it is probable that a more definite answer will be forthcoming for the question. At the present time it is uncertain whether the increased hydrogen ion acts directly on the nervous centers or indirectly by ionizing or activating inactive calcium.

If one accepts cerebro-spinal fluid calcium as representative of diffusible or ionic calcium of the blood, the tetany of hyperventilation cannot be attributed to alterations in ionic Ca since McCance and Watchorn,⁸⁷ as well as Cummings and Carmichael,¹⁰ have reported cases of spontaneous over-breathing tetany without alteration of the Ca content of the cerebro-spinal fluid.

2. *Alterations in Blood Supply to the Central Nervous System.*—Since it has been shown that the cerebral capillaries are quite sensitive to slight shifts in CO_2 tension, it is possible that the behavior effects of shifts in acid-base equilibrium may be attributed to this factor. Schmidt⁷⁰⁻⁷² and Gellhorn²⁴ are of the opinion that the loss of consciousness associated with hyperventilation is due to the relative anoxemia produced in the central nervous system by the vaso-constriction which follows the lowering of CO_2 tension of the blood circulating to the brain. This effect cannot be the whole story, however, since cerebral vaso-dilation produced by histamine is ineffective in stimulating schizophrenics

(Kaufman and Spiegel⁴²). Furthermore, the effects of CO₂ on the lower centers, such as the vaso-motor centers of the mid-brain, tend to produce vaso-constriction in the periphery.

It is possible that at very high CO₂ tensions anoxia of the brain might be severe since the degree of oxygen saturation of the arterial blood would be greatly decreased at CO₂ tensions of 100 mm. Hg. It is important that determinations of CO₂ and O₂ content of the blood be investigated under these conditions.

3. *Dehydration Effects.*—Since shifts towards metabolic acidosis will tend to result in dehydration while the production of an alkalosis tends to induce hydration, some investigators have attempted to explain the behavior effects of metabolic shifts in the acid-base equilibrium in terms of this hydration or dehydration and the results of alterations in cell permeability. For example, Fay¹⁹ is of the opinion that the beneficial effects in reducing the number of epileptic seizures by acid diet is chiefly due to the dehydration produced. Because of the relatively slight changes in water balance as compared with changes in acid-base equilibrium, it does not seem clearly demonstrated that all the effects can be attributed to changes in the water balance.

4. *Effect of Hydrogen Ion Concentration.*—Since most of the physiological and biochemical processes in the body are shown to have optimal pH values in the neighborhood of 7.40, it is possible that the detrimental effects which are observed when the acid-base equilibrium is displaced, may be attributed to interference with biochemical reactions themselves. Since most of the experiments are based on data obtained in vitro, it is obviously necessary to be cautious in drawing conclusions and interpreting such results. For instance, Canzanelli, Greenblatt, Rogers and Rapport⁷ found that O₂ consumption of tissue slices showed a maximum at pH of 9.0.

SUMMARY.

Considering the experimental results obtained it is evident that all too often we must rely on rather casual observations, and that the number of experiments planned to determine relationship between behavior and shifts in acid-base equilibrium is relatively few. However, from the literature we can see that extensive dis-

placement in any direction from the normal area will result in impaired mental function and loss of consciousness, although few quantitative measurements of mental functions or behavior are available. However, certain facilitative reactions may be discovered when acid-base equilibrium is displaced within physiological limits. Slight increases in pH and decrease in CO_2 tension tend to increase motor reactivity to stimuli, particularly at the reflex level, but to decrease functions involving higher levels of the central nervous system. On the other hand, a slight decrease in pH or increase in CO_2 tension may have a facilitative response to a small extent. It is possible that these effects may be due to vaso-motor changes in the cerebral cortex, although proof is still lacking.

No data on the effects of changes in bicarbonate content of blood on behavior are available. With the exception of the experiments on cerebral stimulation in schizophrenia from high CO_2 tension, all the results tend to indicate impairment of function rather than facilitation when the acid-base equilibrium is displaced. The consideration of the possible mechanisms of action indicate the complexity and interrelationship between a variety of variables ranging from ionic strength to shifts in water. In order to obtain a conception of the effects of alterations in acid-base equilibrium on behavior it is obvious that many experiments will need to be performed in which the wide range of variables are measured simultaneously. Even though it may be impossible to control each factor independently by experimental technique, it may be possible to submit the observational data to analysis by other methods.

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SOME PROGNOSTIC CRITERIA FOR THE RESPONSE OF SCHIZOPHRENIC PATIENTS TO INSULIN TREATMENT.*

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INTRODUCTION.

The purpose of this study was to determine whether there are any criteria in the history or in the psychotic manifestations of schizophrenic patients on the basis of which a therapeutic response to insulin treatment may be predicted. It was based on data obtained from 37 schizophrenic patients, 26 men and 11 women. These patients were not selected according to any rigid criteria except that preference was given to recent admissions. The diagnosis in all cases was made by the hospital staff. Two weeks after the completion of treatment the condition of the patient was compared with that which he showed before treatment was begun and he was classed as improved or unimproved. The improved group included only those patients who showed a substantial amelioration and who were judged well enough to be allowed home for a trial visit. In this paper the duration of remission is not considered, but rather the results which immediately followed treatment. Twenty-three of the 37 patients were considered improved and 14 as unimproved.

These two groups were compared with regard to some thirty anamnestic and symptomatic items. Only those factors which appeared to be of a distinctly positive or negative prognostic import are included in this report.

* Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

This is part of a study undertaken jointly by the male admission service and the research service of the Worcester State Hospital to seek data of a psychiatric, physiological or psychological nature which may make it possible to differentiate between patients who will and those who will not respond favorably to metrazol or insulin treatment.

ANAMNESTIC STUDY.

The significance of heredity for prognosis in schizophrenia is still a matter of controversy. Langfeldt's¹ study of 100 schizophrenic patients suggests that the presence in the family of psychoses other than schizophrenia is indicative of a good prognosis. O. Kant's² findings in a follow-up study indicate that manic-depressive psychosis occurs much more frequently in the families of patients who show spontaneous remission and schizophrenia is several times more prevalent in the families of patients who deteriorate. In the group of patients here considered the difference between the hereditary background of the improved and the unimproved patients was small and no conclusion can be drawn. Neither does distinguishing between schizophrenia, other psychoses and psychoneuroses in the heredity show any significant trends.

Among the environmental factors the closeness of relationships between members of the family seems to be of some importance. Those patients whose families were held together only by the houses in which they lived occur much more often in the unimproved group. A poorly integrated family unit, with lack of solidarity among its members, seems to be a serious liability. This factor may be related to lack of emotional security. In going through the emotional stresses of development, the absence of an impregnable home base may well result in a less cohesive personality, a personality which, once split, has less chance of reintegration.

A comparison between the personality of the patient as a child and that of the other members of the family reveals a rather striking difference to which definite significance may be ascribed. The patient who as a child stood out in some way from the rest of the family is found much more frequently in the unimproved than in the improved group. This difference may have been evidenced in such characteristics as greater studiousness, unusual moodiness, stubbornness, etc. The common feature is that these children were thought of as "different" from the others. The fact of having been a so-called "different" child is stressed in the history of 8 of 12 unimproved cases, while it appeared in only 5 patients of 22 who improved. All the children who were considered "different" later

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made a poor or only a fair school adjustment. The suggestion might be made that these patients had some constitutional defect from the start. This suggestion is not strengthened, however, by the fact that the occurrence of psychoses in other members of the families of these "different" children is somewhat less frequent than for the group as a whole. It is possible that the features which made these children appear different from others were the very earliest signs of a tendency toward schizophrenic development. If so, the poor prognosis exhibited later may be related to an extremely insidiously-developing process. Other familial relationships such as sibling jealousy or evident over-attachment to one parent occurred too infrequently to be evaluated.

A history of neurotic traits such as enuresis, pavor nocturnus, frequent temper tantrums and extreme sensitivity is also rather common in the group as a whole, occurring in 18 instances. The frequency of such traits was slightly greater in the patients who did not respond to insulin treatment. This is in keeping with the suggestion made above that the more poorly integrated personality has less chance of recovery, particularly if defective integration is traceable all the way to childhood.

The factor of adjustment to school appears to be of importance. Evaluation of such adjustment is based on general attitude and adaptation rather than on scholastic record. The patients who made only a fair adjustment in this first venture away from the parents into a new social environment constitute more than half of the unimproved group as compared with a quarter of the improved. The fact that these children were not considered in school as definitely bad or good but only fair suggests that they were lacking in sufficient drive either to make a good adaptation or to create trouble. Such difference is not evidenced in regard to industrial adaptation. This may be due to the fact that the occupation in this group consisted mostly of manual labor, which probably makes less demands on social adaptability than does the school.

Considerable difference between the improved and the unimproved patients became apparent also in adaptation to sex. With the exception of 2, all the patients who improved had a history of definite sexual interest or activity other than autoeroticism, while 7 of the unimproved led a life suggesting that no such thing as sex existed for them. Lack of drive in the patients who did not

respond favorably to insulin treatment became apparent in another way when the degree of ambition was considered. It is a matter of conjecture whether these people had defective endocrine systems or some other constitutional defect, or whether they had so difficult a time holding themselves together that they could not spare energy and initiative for other purposes.

In this group of patients there was no significant relationship between age at onset of the psychosis, or between duration of illness and outcome. The mean age at the beginning of treatment of the patients who improved was 25.6 years, of the unimproved it was 24.1 years. Duration of illness before treatment was .9 year and 1.3 years respectively for the improved and the unimproved groups. These differences are not great enough to be of significance when such a small number of patients is involved.

PSYCHOTIC MANIFESTATIONS.

No outstanding difference could be found between improved and unimproved patients with respect to delusions and hallucinations. There was, however, in the group of patients who responded to insulin treatment a slight tendency to doubt their delusional and hallucinatory experiences.

Expressions of autism in overt behavior such as compulsions, posturing, grimacing, etc., are to be considered as definitely unfavorable signs. Such behavior was observed in 9 of the 14 patients who failed to improve, while only 5 of the 23 patients who improved showed such signs.

Formal thinking disturbances such as neologisms and bizarre sentence structure were present in a very small number of cases, hence no comparison of the two groups could be made on this basis.

A probable prognostic sign seemed to be the relative amount of emotional display in the two groups. It does not seem to be too important whether the emotion is depression, anger, fear, anxiety or of some other type. Even the inappropriateness of the reaction is not of primary importance. What seems significant is simply the amount of emotion displayed. The majority of patients exhibiting a considerable degree of emotional reaction responded favorably to treatment. This result may be interpreted on a basis of the

absence of the most ominous deviations of affect, namely, emotional blunting and apathy.

The presence of homosexual or heterosexual interest in the prepsychotic state was considered indicative of a good response to insulin shock treatment. Sexual interests manifesting themselves even in psychotic content or behavior appear to be a favorable prognostic sign. When delusions or hallucinations of a sexual nature or overt sexual manifestations occurred in the psychosis, the results of treatment were much better. A total of 10 patients in the entire group showed such sexual coloring. Nine of them improved under treatment. Sexuality other than autoeroticism is one

TABLE OF THE MOST SIGNIFICANT FACTORS IN PROGNOSIS.

Factor	No. of cases showing factor.	Improved.		Unimproved.	
		No.	%	No.	%
FAVORABLE.					
Atypical diagnosis	7	7	100	0	0
Positive sex interest.....	28	21	75.0	7	25.0
Emotional display	13	10	76.9	3	23.1
UNFAVORABLE.					
Fair school adjustment.....	13	5	38.5	8	61.5
"Different" child	13	5	38.5	8	61.5
Autistic activity	14	5	35.7	9	64.3

of the properties of maturity. Whether weakness of sexual interest is a sign of immaturity or is a manifestation of reduced general drive cannot be stated with assurance. In favor of the latter stands the fact that 9 of these 10 patients who showed sexual interest were considered to have average or more than average ambition.

The type of schizophrenia has definite relationship to prognosis. There were 7 patients in the whole group who were diagnosed as cases of atypical schizophrenia or as not falling readily into any of the conventional subtypes. It is remarkable that all of these patients improved under treatment. The proportion of hebephrenic patients was about twice as great in the unimproved group as in the improved group. The diagnosis of catatonia had been made in 8 of 23 improved patients and in 4 of 14 unimproved patients. Four patients in the improved and 3 in the unimproved groups were diagnosed as paranoid schizophrenia. The one patient with simple schizophrenia did not respond to treatment.

SUMMARY.

A study was made of 37 schizophrenic patients in an attempt to discover factors related to their response to insulin shock treatment. Of good prognostic significance were found to be:

1. The presence of atypical schizophrenia.
2. The presence of considerable emotional reaction.
3. A history of some attempt at sexual adaptation.
4. Manifestation of sexual interest in the psychotic state.

The patients who reacted poorly to the treatment

1. Very frequently came from a poorly integrated family with little solidarity among its members.
2. In many instances as children they were considered in some respect different from the other siblings.
3. They adapted to school in a somewhat worse than average fashion and showed a lack of ambition.
4. They showed very little sexual interest prior to the psychosis and there were no overt sexual manifestations other than auto-eroticism during the psychosis.
5. Almost all of the patients who exhibited autistic behavior (mannerisms, grimacing, posturing, etc.) failed to respond.
6. They showed a picture of typical schizophrenia without extraneous admixtures.

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THE BLOOD GLYOXALASE ACTIVITY OF A SERIES OF MENTALLY NORMAL AND MENTALLY ILL PERSONS.*

By W. R. FRANKS, M. D., AND L. D. PROCTOR, M. D., TORONTO, ONT.

Assuming that glyoxalase is concerned in the breakdown of glucose in nerve metabolism (Geiger)¹ and following the report that methylglyoxal was found in blood, cerebrospinal fluid and urine in human beri-beri cases showing mental changes^{2, 3} an investigation was instituted to ascertain if any significant difference was apparent in the blood glyoxalase activity of normal and mentally ill human subjects.

Glyoxalase estimations on the blood of 208 patients taken at random in a mental and a general hospital are recorded in the table.

The glyoxalase activity per 0.75 c.c. of whole blood was obtained by adjusting for (1) blood glutathione concentration, (2) hæmoglobin concentrations, (3) laked blood (control) values. Thus we presume the resulting figure is a measure of the enzyme activity *per se*.

Methylglyoxal was estimated by Barrenscheen and Dreguss' method⁵ and that of Clift and Cook⁶; glutathione by Benedict and Gottschall's colorimetric method⁷ as applied by Brice⁸ and hæmoglobin concentrations photometrically.

Clinical diagnoses were made by the Toronto General and Toronto Psychiatric Hospitals.

The results in the above series show no apparent significant differences between the composite groups or the larger component groups, *i. e.*, the arithmetic means do not differ by more than twice the standard error of the difference of the means.⁹ The small group of organic nervous diseases (8 male cases) is to be enlarged to ascertain if their comparatively high mean value is of any real significance.

* From the Department of Medical Research, Banting Institute, and the Department of Psychiatry, University of Toronto.

TABLE SHOWING STATISTICAL EVALUATIONS OF DIFFERENCES OBSERVED IN GLYOXALASE ACTIVITY.

COMPOSITE GROUPS.						
No. cases.	Sex.	Diagnosis.	Glyoxalase activity mean value.*	Σ Deviations ² .	Standard deviation [σ].	$3 \times$ standard error of diff. of means.
40	Male	Normal	5.43	43.98	0.91	$\left[\sqrt{\frac{\sigma^2}{N_{(normal)}} + \frac{\sigma^2}{N_{(psychotics)}}} \right]$
81	Male	Psychotic	5.49	64.00		
18	Female	Normal	5.43	10.50	0.88	0.38
69	Female	Psychotic	5.48	58.15		
LARGER COMPONENT GROUPS.						
40	Male	Normals	5.43	43.98	...	...
11	Male	Manic-depressive	5.42	4.95	0.98	0.70
14	Male	Schizophrenia	5.78	5.97	0.97	0.62
8	Male	Organic nervous disease	6.25	...	...	...
18	Female	Normals	5.43	10.50	...	...
25	Female	Manic-depressive	5.25	16.98	0.80	0.46
17	Female	Schizophrenia	5.24	20.16	0.94	0.66

* The glyoxalase activity value was obtained by measuring the methylglyoxal disappearing from approximately 10 mg. of this substance added to a buffered mixture of twice washed (isotonic saline) red blood cells, obtained from 0.75 c.c. of whole blood. The system was incubated at 25° C. for 30 minutes under continuous agitation. These conditions were found to be optimal for substrate and enzyme concentration and temperature. This method of blood glyoxalase estimation is a modification of the method of Jowett and Quastel.⁴

It is noteworthy that one mental case (manic-depressive psychosis) showed a methylglyoxal-like substance in his cerebrospinal fluid. The sample was taken at the height of his psychomotor hyperactivity. Another patient, also a manic-depressive type of psychosis, showed a consistently low blood glyoxalase activity which returned to within normal limits on her clinical recovery.

The authors wish to express their appreciation for the cooperation and advice given by the staffs of the Toronto General and Toronto Psychiatric Hospitals.

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NEUROMETABOLIC DEFICIENCY IN OLD AGE. (SENILE ENCEPHALOMYELOSIS.) *

By ERWIN WEXBERG, M. D., NEW ORLEANS, LA.

Nutritional deficiency is of growing importance as an essential factor in diseases of the nervous system, including both spinal and peripheral neurologic syndromes and psychiatric conditions of the organic reaction type. With that development there has grown up a wider and more complex concept of "deficiency." Not very long ago the only recognized deficiency diseases of the nervous system were beri beri, due to avitaminosis B₁, and pellagra, with or without psychosis, due to avitaminosis B₂.

Further observation and experimentation, however, have made certain other factors clear:

1. A deficiency of many vitamins other than the B group may be responsible for neuropsychiatric conditions.

2. Improper diet is not the only cause of vitamin deficiencies. They may be due to other causes, such as alcoholism or gastrointestinal disease.

3. Human pathological states seldom if ever duplicate the conditions established artificially in animal experiments, in which a single vitamin deficiency, and no other cause, can be made responsible for a pathologic state.

4. In addition to the catalytic agents supplied by food, which we call vitamins, there are other agents, such as the "intrinsic factor," a deficiency in which is responsible for pernicious anemia, which act in the same fashion as vitamins and in close cooperation with them. In other words, the deficiency formula in any given case may eventually be found to be far more intricate than we have any realization of today.

Once the concept of a clinical picture due to a single, well-defined etiologic factor is abandoned, it would seem wise to start afresh

* Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

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with a general, unprejudiced conception covering only what we really know: That we are dealing with some metabolic deficiency, either intrinsic or extrinsic, and that the nervous system is involved in it.

On the basis of this concept I have employed the term neuro-metabolic deficiency. It seems justified not by our knowledge but rather by our lack of knowledge. Our next step must be to establish clinical disease entities which fit into this rather large frame of neurometabolic deficiency and which can be clearly differentiated from one another. Only when this has been accomplished will the attempt to identify specific groups of factors referable to specific deficiency diseases be at all warranted.

The purpose of this paper is to describe one of these special disease entities. In the course of our clinical studies on deficiency diseases, which were begun several years ago, it became clear to us that although most of the cases under observation appeared to be rather equally distributed according to age and sex, that did not hold for the special group to be described herewith.

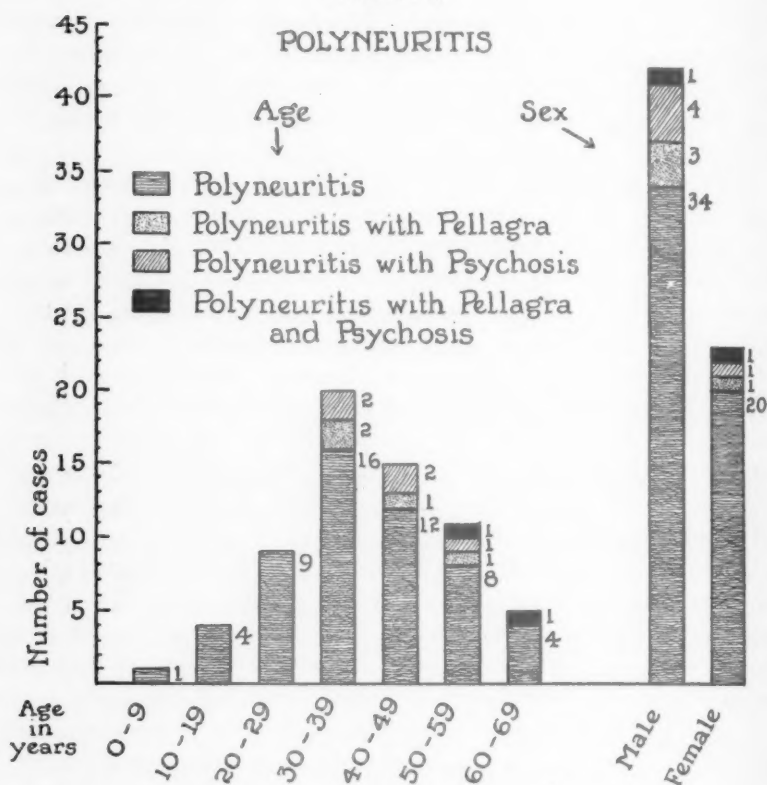
The distribution in polyneuritis (Table 1) shows the peak of the incidence in the fourth and fifth decade and among males. Both facts are easily explained; the group includes cases of alcoholism, which is naturally much more frequent among males, and the age distribution is what would be expected in a deficiency disease to which alcoholics are subject.

In the group of myeloses (Table 2), however, the distribution of cases both as to age and sex is altogether different from the distribution of the polyneuritides. We have observed in the last several years only one patient with myelosis who was less than 40 years of age, and no patient with myelosis and psychosis who was less than 50 years of age. The incidence, both for uncomplicated myelosis and for myelosis with psychosis, was highest in the sixth and seventh decades. Females predominated in the cases of myelosis without mental symptoms and there was no male in the seven cases of myelosis with psychosis.

The age distribution in the group of psychotic cases (Table 3) is the same as in the polyneuritides, the highest incidence being in the middle years of age. The fact that in the psychoses the highest incidence was in the third and fourth decades, whereas in the polyneuritides it was in the fourth and fifth decades, is interesting,

but the number of cases is too small to permit conclusions. If a larger amount of material were to show the same age distribution, a possible explanation would be that a number of cases included in this group were really cases of schizophrenia which presented an initial picture of an acute psychosis.

TABLE 1.

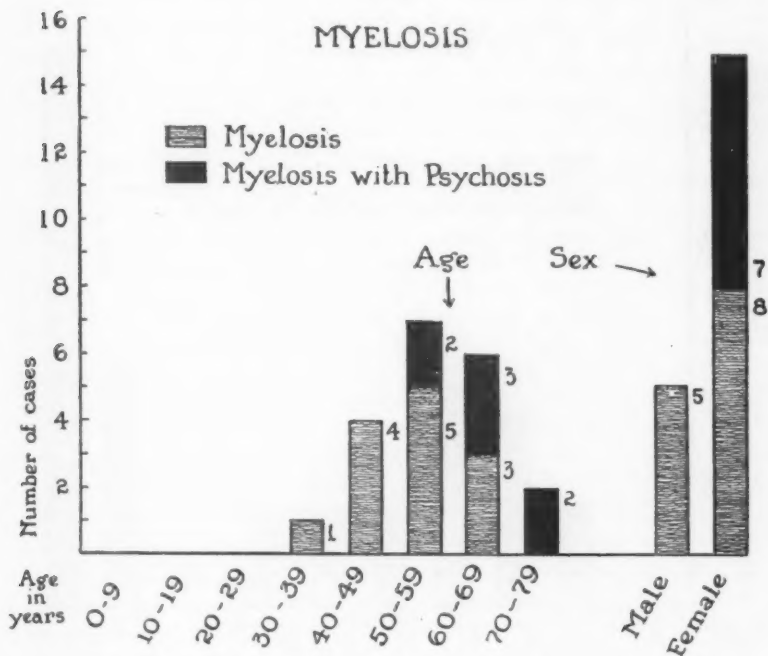


More definite statements, on the other hand, can be made concerning the predominant sex incidence in the psychotic group, for the sex ratio is not confused as it is in the polyneuritides by the inclusion of alcoholic cases. The alcoholic psychoses are encountered much less frequently in a general hospital than might be expected from observation of their incidence, because the majority of patients suffering from psychoses due to acute alcoholism are

in such a condition that they must be sent directly to a hospital for mental diseases. With alcohol being almost entirely discarded as an etiologic factor, a prevalence of female cases in the psychotic group becomes apparent.

Our observations would thus seem to indicate that in certain groups of deficiency diseases the factors of age and sex are of some importance. A detailed analysis of our material justifies us,

TABLE 2.



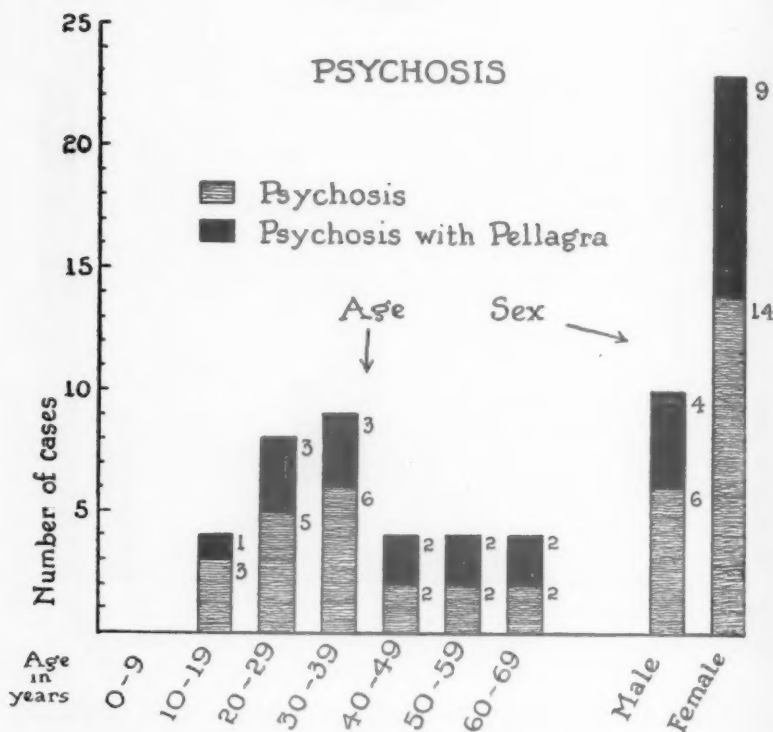
we believe, in considering the group of myeloses with psychoses (Table 2) as the kernel, so to speak, of a clinical syndrome which consists of a spinal pathologic state, usually of the posterolateral sclerotic type, combined with a psychosis of the organic reaction type. Either the spinal or the psychiatric phases of the syndrome may be temporarily or permanently absent, and that fact would account for the statistics listed under the heading of uncomplicated myeloses and of psychosis with or without pellagra. It may be assumed that these three groups probably include an indefinite num-

ber of incomplete cases such as those listed under the heading of myeloses with psychoses (Table 2).

There typical cases of myelosis with psychosis will serve to illustrate the clinical picture in this group:

CASE 1.—L. W., a white female 71 years of age, complained of weakness, anorexia and loss of weight for the past four or five months. The details of

TABLE 3.



her previous history were irrelevant. She was quiet but mentally confused and disoriented, with hazy consciousness and memory for recent events very poor. She rambled in her speech and told entirely contradictory stories. At times during the period of observation she became unmanageable and required restraint.

Physical examination revealed emaciation, kyphosis, and marked hirsutism (mustache and beard). The blood pressure was 128/70. There was no essential cardiac pathology, but a moderate arteriosclerosis was present. There was nystagmus toward both sides, but no other cranial nerve symptoms,

no palsy, and no disturbance of skin sensation. The reflexes of the upper extremities were positive and equal. Patellar and Achilles reflexes were absent on both sides. Oppenheim's sign was positive on both sides and Babinski's sign was positive on the right. The position sense was normal but the vibration sense was absent in both legs. Blood studies showed 3,700,000 red cells per cu. mm., and 75 per cent hemoglobin.

CASE 2.—C. W., a colored female 63 years of age, had been weak for the past several months, and at times had been unable to walk. She was also deteriorating mentally. For three or four years she had frequent, severe headaches, dizzy spells and fainting spells, and often saw spots before her eyes. Occasionally her legs were swollen. She also complained of dyspnea and palpitation on exertion. For the past four months her gait had been unsteady, and often she fell forward and could walk only if supported. She complained of a numb, heavy feeling and of pain in her feet. Eight days before admission she had fainted and since then her mind had been clouded and her memory impaired. Her diet had been poor, with little vegetable or fruit content. She did not drink alcohol.

During observation the patient talked incoherently and appeared to answer voices she was hearing. At times she said that people were calling her and telling her things. She was alternately euphoric and apprehensive. Physical examination revealed a well nourished woman, with a blood pressure of 180/105. Urinalysis revealed 2 plus albumin and a trace of dextrose. Blood study showed 3,600,000 red cells per cu. mm. and 70 per cent hemoglobin. Gastric analysis showed free hydrochloric acid 27° and total acidity 45°. The blood and spinal fluid Wassermann reactions were negative. Neurologic examination showed considerable ataxia of the lower extremities. The patient fell forward when trying to walk. The patellar and Achilles reflexes were absent. Babinski's and Oppenheim's signs were positive on the right.

On a high-vitamin and high-caloric diet, with yeast, thiamin, nicotinic acid and potassium iodide the patient's condition improved rapidly.

CASE 3.—A. L., a white female 69 years of age, had been treated on previous occasions during the past eight years for gastric anacidity, amebiasis, spastic colitis, and a possible gastric carcinoma. On the present admission she complained of nausea and said that her food remained behind her sternum. She had had diarrhea for 16 years.

The patient was quiet during observation but her speech and actions were abnormal. She cried frequently and her memory for recent events was very poor. At times she was slightly confused and disoriented, and sometimes she was very restless and had to be restrained. She was slightly negativistic and her mood was that of perplexity. The blood pressure was 130/90. The skin was dry and the nails dry and thickened. The blood study showed 3,610,000 red cells per cu. mm., 86 per cent hemoglobin, color index 1.1, and hematocrit 35.2. The reticulocytes numbered 3.1 per cent. Macrocytosis was present, with slight anisocytosis and poikilocytosis. Urinalysis and blood Wassermann reaction were negative, and the blood chemistry was within normal range. The pupils reacted to light. The patellar and Achilles reflexes were absent and Babinski's sign was positive on both sides.

The mental picture in this condition, as can be gathered from these cases, is that of a confusional state, with more or less marked loss of recent memory. Neurologically the signs of posterolateral sclerosis (myelosis) are present. A moderate anemia was present in all three of the reported cases, being of the hypochromic type in two cases and close to the pernicious type in one. The deficiency was accounted for by poor diet in one case and by chronic gastrointestinal trouble in another, but could not be accounted for at all in the third case.

In addition to the observations made in these three specimen cases, certain other statements can be made about the general clinical picture. In the first place, the mental syndrome is always that of an organic reaction type, and most frequently resembles that present in these three cases. Paranoic or hypochondriac delusions occur occasionally, and depression and elation are about equal in frequency. In more advanced cases, simple dementia and disturbance of sensorium are predominant.

In the second place, the neurologic findings are most often those of posterolateral sclerosis (myelosis). Occasionally there are associated symptoms, such as tenderness of the calf muscles, which may be interpreted as peripheral neuritis. In one of our personal cases we observed a sensory disturbance down from some thoracic level together with a posterolateral sclerosis which seemed to be combined with a transverse lesion. The pictures of transverse myelitis and spastic paraplegia were present in one case each. Vague cerebral symptoms, such as a positive Romberg's test, choreiform movements, tremors, nystagmus, and slurred speech were occasionally observed. It is still uncertain whether they should be considered part of the syndrome or whether they can be accounted for by the usually concomitant cerebral arteriosclerosis.

Finally, as far as the medical status is concerned, anemia and hypochlorhydria or achlorhydria are characteristic. The anemia is more often of the hypochromic than of the pernicious type, and may be accompanied by hypoacidity or anacidity, though the association is not uniform. In a number of cases skin eruptions and pigmentations of the pellagrous type were present, though pellagra in our material was more frequent in younger subjects.

The remarkable feature, and from a practical standpoint the most important feature, is that most patients to whom treatment

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was given reacted almost immediately to a high vitamin diet, liver extract, vitamin B₁ preparations, thiamin-sulphate, nicotinic acid and cod liver oil (Table 4). Not all forms of therapy were used in every case.

The average age of the 26 patients treated was 60.5 years and the range was from 50 to 73 years. Sixteen were females and 10 males. In the 21 cases in which blood studies were done, there were five cases of pernicious anemia and 16 of hypochromic anemia, only two of which could be considered as almost within normal

TABLE 4.

DIAGNOSIS	NO CASES	BLOOD PICTURE	RESULTS
<i>Myelosis</i>	6	3 hypochromic anemia 3 pernicious anemia	5 improved 1 death
<i>with Psychosis</i>	8	4 hypochromic anemia 1 pernicious anemia	5 improved 1 unchanged
<i>Polyneuritis</i>	3	3 hypochromic anemia	2 deaths 1 improved
<i>with Psychosis</i>	1	1 hypochromic anemia	1 improved
<i>Psychosis</i>	8	4 hypochromic anemia 1 pernicious anemia	5 improved 1 unchanged 2 deaths
<i>Transverse Myelitis</i>	1	1 hypochromic anemia	death
<i>with Psychosis</i>	1		death
<i>Totals</i>	26	16 hypochromic anemia 5 pernicious anemia	17 improved 2 unchanged 7 deaths

limits. Most of the seven deaths were due to pneumonia and practically all of them occurred so promptly after admission to the hospital that treatment could not have been expected to have any effect. On the other hand, in eight of the cases in which therapy was effective, improvement occurred so rapidly and so spectacularly that there could be no possible doubt that it was due to the therapy employed.

The majority of the psychiatric patients were admitted with the diagnosis of cerebral arteriosclerosis or senile dementia. Such conditions as confusional states and Korsakoff's syndrome are familiar features of senile dementia, cerebral arteriosclerosis, and

involutional psychosis.* Whether, in a given case, involutionary (degenerative) or neurometabolic factors, or both, are involved, can hardly be determined by psychiatric observation.

Accordingly, the question arises as to whether the diagnosis of neurometabolic deficiency, or, as it might be termed, *senile* (pre-senile) *encephalomyelosis* might not include a large number of cases which formerly were classified under such a term as senile dementia. Senile encephalomyelosis ought to be considered as a possibility whenever, together with a psychosis of the organic reaction type, additional signs are present which could be interpreted as due to metabolic deficiency. Such signs would include: posterolateral sclerosis or some other spinal syndrome of the "myelitic" or "degenerative" type; polyneuritis; anemia, of the hypochromic or pernicious variety, with or without gastric anacidity (hypoacidity); or a pellagrous condition of the skin. Combinations of these signs, particularly when associated with marked emaciation, ought to raise the suspicion of a deficiency disease, particularly in elderly women. In such cases tentative vitamin therapy would seem to be justified. The diagnosis appears established if and when such treatment gives immediate beneficial results.

The relation of the deficiency factor to mental diseases of old age has not received much attention. Marchand⁶ denies the importance of infectious, toxic-infectious and toxic factors in senile dementia, Alzheimer's disease and Pick's disease, which, he believes, have a prevalently constitutional and hereditary etiology. It is, however, important to note that there is no parallelism between the degree of pathological changes in the brain and the degree of psychosis (Rothschild,⁷ Gellerstedt,⁸ Von Braunmühl⁹). The pathologic picture of senile dementia frequently occurs in association with normal senility (Gellerstedt⁸).

G. W. Robinson, Jr.,¹⁰ has reported observations which seem rather similar to our own. He obtained surprising results from dextrose infusions in 16 cases of senile delirium, which proves, in his opinion, that structural damage was not the sole cause of the psychosis. His explanation is that the senile change of the cerebral

* The confusional type of senile psychosis, or senile delirium, has been described by F. M. Barnes,¹ Rosanoff,² Jelliffe and White,³ Henderson and Gillespie,⁴ Strecker and Ebaugh,⁵ and others.

carbohydrate metabolism so impairs the adjustability of the brain to various destructive forces that minor illnesses, operations, injuries and similar causes may set up a vicious circle. Still more recently, Jolliffe and his co-workers¹¹ reported 150 cases of an encephalopathic syndrome, characterized by clouding of consciousness, cog-wheel rigidity and uncontrollable grasping and sucking reflexes, which may or may not be associated with polyneuritis, pellagra, or the oculomotor signs of central neuritis. The mortality, which previously had been almost 100 per cent, had been reduced by nicotinic acid medication to 13.6 per cent. Cleckley and his co-workers¹² also reported 19 cases of atypical psychotic states successfully treated with nicotinic acid. The patients exhibited various signs of nutritional deficiency, and 12 of the 19 were between 54 and 78 years of age. A similar case, in a 58-year-old patient, has been reported by Weinberg.¹³

The predominance of female patients has not been emphasized in the literature on neuropsychiatric deficiency states in old age. It is significant, however, that achylic hypochromic anemia, which we frequently found associated with the neuropsychiatric syndromes, is primarily a disease of the female sex (Mansfeld and Sös¹⁴). The blood count in old age is normally low, within normal limits (Mueller-Deham¹⁵). Pernicious anemia is known to be frequent at this period of life. "Senile hyperchromia," without signs of pernicious anemia, occurs in association with normal as well as subnormal gastric acidity values. Cases of achylia with hypochromic anemia have also been recorded (Mueller-Deham¹⁵).

Studies on senile metabolism may throw some light on the pathogenesis of the clinical pictures in question. According to Mueller-Deham,¹⁵ it is necessary to take into account some disturbance of central regulations of metabolism. The highest degree of disturbance is represented by cases of "primary cachexia" (Mueller-Deham¹⁵), which is usually associated with gastric anacidity. Gastric anacidity is also associated with Naunyn and Schlesinger's "senile anorexia" (cited by Mueller-Deham¹⁵), which seems to be a more acute form of primary cachexia. Senile anorexia has often been found combined with states of excitement and delirium and character changes. It is frequent in old age, even in individuals with apparently healthy stomachs (Lasch,¹⁶

Mueller-Deham,¹⁵ Ewald,¹⁷ Fenwich,¹⁸ Davies and James,¹⁹ Lucchi,²⁰ and others).

No satisfactory explanation of the disturbances in question and of their occurrence in aged individuals, particularly aged women, can be offered. The sex factor would seem to point toward an endocrine origin. It is known that in old age changes in hormonal production occur in the pituitary gland, the thyroid gland and, of course, the ovaries. For various reasons the pituitary is more likely to be responsible for the disturbance than the other glands. Increase of prolactin production occurs in old age (Mueller-Deham¹⁵), and the acromegaloïd increase in size of some of the distal parts, which is sometimes seen in old age, is probably due to increased activity of the pituitary cells. E. Lyon²¹ mentions the relation between Cushing's hypophyseal adenoma (basophilism) and the obesity which accompanies hypertension and senile osteoporosis in elderly women. Kylin²² suggests that the hyperfunction of the anterior pituitary in these women is due to a reduction of the inhibiting influences of the ovaries. According to Raab,²³ adenoma of the anterior pituitary gland simulates, to an exaggerated degree, the chief signs of old age. On the other hand, the cachexia and anemia of Simmonds' disease, while in no way identified with senility, furnish at least additional evidence of the far-reaching influence of pituitary hormones on metabolism and hematopoiesis.

It would be entirely wrong to conclude, merely because of the beneficial effect of vitamin therapy in our cases, that nutritional deficiency in its usual sense is responsible for the disturbances described. On the other hand, it seems, regardless of the origin of the primary obnoxious influence, that it may be checked by hypervitaminization. There is every reason to believe at the present time that the vitamin treatment of senile encephalomyelosis is far from etiologic therapy. It is doubtful, however, whether the still unknown causes are likely to prove amenable to radical cure. They are likely, instead, to be part of the regressive changes associated with old age, and, as such, to be irreversible. An effective palliative measure such as hypervitaminization, therefore, is almost all that we can hope for.

SUMMARY AND CONCLUSIONS.

1. A series of observations carried out on clinical material seems to justify the delimitation of a clinical picture for which the name of senile encephalomyelosis is suggested.

2. The symptoms of senile encephalomyelosis are acute or sub-acute mental disturbances of the organic reaction type, usually associated with posterolateral sclerosis (rarely transverse myelitis or spastic spinal paralysis), sometimes associated with polyneuritis and very often associated with hypochromic or hyperchromic anemia, with or without gastric anacidity (hypoacidity).

3. Senile encephalomyelosis appears to be much more frequent in women than in men.

4. The relationship of senile encephalomyelosis to senile anorexia, primary cachexia, senile hypochromic achylic anemia and pernicious anemia can be established.

5. Hypervitaminization, particularly treatment with vitamin B₁, liver extract and nicotinic acid, seems to give very good results.

6. Every case of so-called senile delirium or of the apparent confusional and hallucinatory type of senile dementia should be examined from this point of view and tentative hypervitaminization should be instituted.

7. The pathogenesis of senile encephalomyelosis is unknown. A possible hypothesis, however, is that hormonal and more especially, pituitary disturbances might be responsible.

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PROGNOSIS IN DRUG ADDICTION.*

By M. J. PESCOR.

This study has a twofold purpose: first, to determine what factors in the history and examination of hospitalized drug addicts influence the prognosis; second, to evaluate the accuracy of the prognosis as revealed by follow-up investigation of addicts who have been released from the hospital.

The data were obtained from the clinical records of 1,036 patients admitted for the treatment of narcotic drug addiction to the United States Public Health Service Hospital, Lexington, Kentucky, during the fiscal year July 1, 1936 to June 30, 1937. The patients undergoing such treatment include prisoners, probationers and voluntaries. The latter enter the hospital of their own volition and may leave whenever they please, but are urged to stay a minimum of six months. Probationers are law violators whose sentences have been suspended provided they receive treatment for drug addiction. They must remain in the hospital until pronounced cured by the medical staff, usually about nine months. Prisoners, of course, are law violators who have definite sentences to serve.

The information contained in the clinical files was condensed and transcribed to Hollerith statistical punch cards. Seventeen of the 1,036 cases were excluded from the final tabulation, fourteen because the patients died during the fiscal year, and three because there was some doubt as to addiction. The Hollerith cards were sorted first according to prognosis into three categories; namely, good, guarded and poor. These categories were in turn cross-tabulated with various other data. The numerical frequencies thus obtained were converted to percentages. Percentage differences between good, guarded and poor prognoses for each factor were next determined and tested for statistical significance by the use of Schreck's nomogram.¹

* Read at the ninety-sixth annual meeting of The American Psychiatric Association, Cincinnati, Ohio, May 20-24, 1940.

Only 8.6 per cent of the patients were given a good or better-than-average prognosis. This is understandable since even the most optimistic psychiatrist is reluctant to state positively that an addict has been cured of his drug addiction. About half of the patients (49 per cent) were given a guarded prognosis and 40.7 per cent a poor prognosis. The remaining 1.7 per cent were excluded from the study as previously explained.

PROGNOSIS GOOD.

The simplest method of summarizing significant favorable prognostic factors is to describe an hypothetical addict with good prospects for a cure of his drug addiction. This statistical individual is a probationer patient about 40 years of age who became therapeutically addicted to the use of morphine for the alleviation of a painful or distressing physical condition. He has confined himself to the use of morphine without any interruption for a period of less than a year; that is, he has had no previous cures either voluntary or compulsory.

Prior to addiction he made a good social adjustment and had no delinquency record. Since addiction he ran afoul of the law by forging a narcotic prescription impelled by the necessity for securing morphine. For this offense he was given a probationary sentence.

His parents were in comfortable economic circumstances and the patient was brought up in a congenial atmosphere under kindly discipline. He made an apparently normal childhood adjustment and was equally attached to his parents. He has a history of steady employment with a comfortable income. He has a wife and at least one child dependent upon him. As an adult he has lived in a good rural or semi-rural community.

He displays excellent insight, realizing that the use of drugs has been harmful to him in every way socially, mentally and physically. Psychometric examination discloses that he has a mental age of 14 years 6 months. The psychiatric diagnosis is normal individual accidentally addicted.

His institutional adjustment has been entirely satisfactory. He is described by his supervisors as a normal, pleasant, agreeable individual who abides by the rules and regulations of the institu-

tion. He shows an excellent knowledge of his occupational assignment and on his own initiative does more work than he is required to do. He has been the recipient of intensive physical rehabilitative measures. Looking forward to his release he has secured both a job and parole advisor. He will return to his home in a good environment and rejoin his family.

PROGNOSIS POOR.

The hypothetical individual with poor prospects for a cure of his drug addiction is an uncooperative voluntary patient over 50 years of age who sought admission to the hospital because the law was "hot on his heels." He became addicted to the use of drugs while in his twenties as a means of sobering up after alcoholic sprees. Following that he tried all kinds of drugs including cocaine, opium, heroin and morphine, but finally picked heroin as his drug of choice. During his 20 odd years of addiction he had three or more compulsory cures in jails or penitentiaries but on each occasion relapsed within a month after he was set at liberty. He had no better success with the three or more voluntary attempts to rid himself of his habit. In the first place, he would not remain in the hospital or sanitarium over four weeks and in the second place he immediately looked up his old associates when he left the hospital. This propinquity inevitably led to a relapse within a month of his cure.

He made a poor social adjustment both before and after addiction. Even as a child he was incorrigible and antisocial. After his addiction he did not confine himself to violation of the drug laws, but committed other crimes as well, both major and minor. He was convicted three or more times and spent four or more years in prison.

His parents were in marginal economic circumstances. The family relationships were distorted in that the patient showed an abnormal attachment to his mother.

He has no one dependent upon him. As an adult he has lived in a deteriorated metropolitan or urban environment. He gives as his occupation some type of work classified as domestic and personal service, but his income is wholly or in part derived from illegitimate activities or the proceeds from gambling. His economic

status is marginal. His past medical history includes a gonorrheal infection.

His lack of insight is demonstrated by the fact that he believes he cannot make a satisfactory adjustment to life without the benefit of drugs. The psychiatric diagnosis is psychopathic personality.

During his present period of hospitalization he was uncooperative, disagreeable and a constant complainer. He displayed no interest in his occupational assignment and shirked work at the slightest opportunity. He violated major institutional rules and regulations and was unpopular with his fellow patients. Finally he demanded his release against medical advice with no job and no plans for the future except to get a "shot" at the earliest opportunity.

PROGNOSIS GUARDED.

The hypothetical individual with a guarded prognosis is an admixture of Dr. Jekyll and Mr. Hyde. Compared with the good prospect he looks bad; compared with the poor prospect he looks good. In other words he is truly the average addict who has been described in a previous paper.² Such a hybrid individual is a white male prisoner, 38 years of age, given a two-year sentence for the illegal sale of narcotics. His family history is positive for such familial diseases as cardiac disease, tuberculosis or cancer and if any psychopathic determinants exist they are most likely alcoholism and drug addiction.

His parents were in marginal circumstances, average disciplinarians and the family relationships were congenial.

The patient is one of several children, a native of native parentage, whose parental home remained intact up to the age of 18 years. He made a normal childhood adjustment and was brought up in religious faith, but discontinued church affiliations as an adult. He was graduated from the eighth grade, taking up an occupation classified in the domestic and personal service. As an adult he has lived in a deteriorated metropolitan section. More than likely he has had to resort to illegal means of earning the additional income needed to support his drug habit. He married but his marriage terminated in separation and divorce. No children

were born to this union, possibly because drugs deprived him of his normal sexual urge. He is tolerant of all forms of vice, occasionally indulging in all forms. He has had no military service.

He became addicted to morphine at the age of 27 through the influence of associates and curiosity. He has used more than one narcotic drug but prefers morphine when it is obtainable. During his addiction period of 10 years he has had no voluntary cures but did have one or two enforced cures, following which he remained abstinent about two years, relapsing because of association and desire to recapture the original pleasant sensations produced by drugs.

His first arrest occurred at the age of 28 for violation of the drug laws. He had no delinquency record prior to addiction. Since addiction his offenses have been confined to violation of the drug laws for which he has received one previous penitentiary sentence and one jail sentence serving approximately three years behind bars.

He gives a history of the usual childhood diseases without complications, but as an adult he has been subject to some chronic diseases such as heart trouble, arthritis, tuberculosis or asthma. He denies any mental disorders, but admits a gonorrheal infection. Physical examination reveals poor dentition and defective vision. Psychometric examination discloses a mental age of 13 years 8 months. The psychiatric diagnosis is psychopathic diathesis which means that the patient has an uncrystallized personality defect and that he became addicted through the desire to seek new thrills.³

During his stay in the institution he lived up to the various rules and regulations, displayed an interest in his occupational assignment, and was a willing worker. His fellow patients accepted him as a member of the group. His supervisors found him pleasant and agreeable. As the time for his release approached he maintained that he was through with drugs forever because he did not want to spend the rest of his life in jail, indicating that he still thought drugs were beneficial but the penalty outweighed the benefit. He planned to live with responsible relatives largely at the insistence of the hospital officials. However, he had no employment and no parole advisor.

DIFFERENTIAL CRITERIA.

Actual tabulation of the differential criteria in the order of significance will be found in the appendix. The most heavily weighted factor is insight. In other words, does the patient condemn the use of drugs as harmful in every way; does he state that the legal penalty outweighs the benefit; or does he feel that drugs are necessary for a satisfactory adjustment to life regardless of the penalty. The important elements in the antisocial history are delinquency prior to addiction, delinquency confined to violation of drug laws, recidivism, and total time served in previous sentences. The prominent factors in the addiction history are the presence or absence of previous compulsory or voluntary cures, the use of cocaine, the use of morphine exclusively, the use of more than one drug, and the duration of addiction. The status of the individual also plays a part especially if he is an uncooperative voluntary patient.

Institutional adjustment as exemplified by ungrudging compliance with rules and regulations is given considerable weight. So is the attitude toward occupational therapy; that is, a knowledge and interest in the work assignment and willingness to do more than is required of the patient. The ordinary addict resents any demands upon him beyond his routine duties, while the uncooperative patient shirks even his routine assignment. The opinion of officers who have supervision over the patients is also given recognition in the prognosis. Finally, future plans play an important rôle. A good home, some measure of economic security, and, in the case of a prisoner or probationer, a parole advisor are of distinct value in helping the patient to adjust to life without recourse to drugs.

RELIABILITY OF THE PROGNOSIS.

Follow-up studies of patients released from the hospital are grossly inadequate, but a make-shift attempt has been inaugurated to find out what happens to these men after they leave. The Federal Bureau of Investigation sends us a report on any patients who have been subsequently arrested and whose finger prints have been sent to the Bureau for investigation. In this way it is possible to trace the patient and to find out from the arresting authorities

whether or not the patient has relapsed to the use of drugs. The status of patients discharged on parole or conditional release can be learned from their respective probation officers. As an additional but questionable source of information letters are sent out to all former patients every six months asking them whether or not they have relapsed, emphatically assuring them that the information will be kept confidential. If the patients fail to reply, their nearest relatives are contacted by letter requesting similar information under similar assurances.

Practically all (95 per cent) of the 1,036 patients whose case histories were utilized in the present investigation have been released from the hospital. At the time the most recent follow-up reports were received the voluntary patients had been out about

TABLE I.

PERCENTAGE DISTRIBUTION ACCORDING TO PRESENT STATUS OF ADDICTION AND ORIGINAL PROGNOSIS.

Prognosis.	Abstinent.	Relapsed.	Dead.	Still in hospital.	Transferred to another institution.	No record.
Good	43.8	24.7	6.7	0.0	1.1	23.7
Guarded	36.9	28.2	2.0	1.6	5.5	25.8
Poor	20.7	37.4	5.0	2.9	0.8	33.2
Total	30.4	31.2	4.9	1.9	3.2	28.4

29 months, the probationer patients 26 months, the prisoners an average of 17 months, and all three combined an average of 20.1 months. Table I shows the present status of these patients.

There is no significant difference between a good and guarded prognosis as far as subsequent abstinence or relapse is concerned. There is, however, a significant difference between a good prognosis and a poor prognosis statistically substantiated by reference to Schreck's nomogram. The difference between a guarded and poor prognosis is likewise statistically significant. For practical purposes the prognosis may just as well be reduced to two categories, poor and guarded.

SUMMARY.

1. Statistically significant criteria distinguishing good, guarded and poor prognoses from each other were determined on the basis

of the clinical records of 1,036 drug addicts admitted to the U. S. Public Health Service Hospital at Lexington, Kentucky, during the fiscal year July 1, 1936 to June 30, 1937.

2. Case histories of composite individuals most representative of their respective prognoses are presented.

3. Follow-up studies made of the patients after release from the hospital reveal that 43.8 per cent with a good prognosis, 36.9 per cent with a guarded prognosis, and 20.7 per cent with a poor prognosis were still abstinent.

4. For practical purposes the prognosis may be reduced to two categories, poor and guarded.

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APPENDIX.

A. Based on the clinical records of 1,036 hospitalized drug addicts the following criteria, in the order of significance, distinguish a guarded from a good prognosis for the permanent cure of addiction:

GUARDED PROGNOSIS.

1. Insight—believes drugs are of some benefit, but will remain abstinent because of fear of imprisonment.
2. Explanation for relapse following prior treatments—association with addict friends.
3. History of convictions for major offenses after addiction.
4. Future plans—will return to home in poor environment, has no job, no parole advisor.
5. Has used cocaine in addition to other drugs.
6. Gives a history of three or more compulsory cures in jails or penitentiaries.
7. Antisocialism not confined to violation of drug laws.
8. Future plans—has no home to return to, no job and no parole advisor.

GOOD PROGNOSIS.

- Insight—believes drugs are harmful from every standpoint, social, mental and physical.
- Has never been off drugs since original addiction.
- No history of previous convictions.
- Total time served in previous convictions—none.
- Antisocial only in respect to the use of drugs.
- No history of compulsory cures in jails or penitentiaries.
- Future plans—has a good home to go to, a job and a parole advisor.
- Attitude toward occupational therapy—shows initiative; does more work than requested of him.

GUARDED PROGNOSIS.

9. Economic adjustment—supplements his income through illegitimate activities.
10. Total time served in previous sentences—2 to 4 years.
11. History of two previous convictions.
12. Has used heroin exclusively.
13. Longest period of abstinence following compulsory cure—less than one month.
14. Psychiatric diagnosis—psychopathic personality.
15. Has used heroin in addition to other drugs.
16. Lives in a deteriorated neighborhood or slum section.
17. History of luetic infection.
18. History of three or more misdemeanors, i. e., minor violations of the law.
19. History of misdemeanors committed after onset of addiction.
20. Institutional adjustment—average cooperation, indifference.
21. Longest period of abstinence after compulsory cure—over one month, under two years.
22. Extramural occupation—domestic and personal service.
23. Occupational therapy—average knowledge of work assignment.
24. History of one previous conviction.
25. Total time served in previous sentences—over 4 years.
26. Prisoner patient.
27. History of 1 or 2 compulsory cures in jails or penitentiaries.
28. Attitude toward occupational therapy—willing worker but shows no initiative; does only what he is told to do.
29. Future plans—has a home to return to, but no job or parole advisor.
30. History of incorrigibility or antisocial tendencies in childhood.
31. Economic status—marginal.
32. Duration of addiction—over 5 years, under 20.
33. Has no religious denominational preference.
34. Has no dependents, i. e., wife or children.
35. Disposition of first arrest—jail or reformatory sentence.
36. Last drug used—heroin.
37. History of 3 or more previous convictions.

GOOD PROGNOSIS.

- Brought up in a good neighborhood.
- No history of misdemeanors or minor violations of the law.
- Psychiatric diagnosis—normal individual accidentally addicted.
- Occupational therapy—displays excellent knowledge of his work assignment.
- Has used morphine exclusively.
- Economic adjustment—history of steady employment.
- Institutional adjustment—very cooperative, abides by rules and regulations.
- Patient's explanation for use of drugs—therapeutic necessity for the relief of pain and physical discomfort.
- Duration of addiction—1 year or less.
- Economic status of patient—comfortable.
- Brought up in Protestant faith.
- Voluntary patient, cooperative.
- No delinquency record after addiction.
- No record of arrest at any time.
- Social adjustment acceptable despite addiction.
- Well thought of by his fellow patients.
- Last drug used—morphine.
- Brought up in a congenial home under kindly discipline.
- Has a college education.
- Economic status of parents—comfortable.
- Extramural occupation—agriculture.
- Home in rural or semi-rural environment.
- Duration of addiction over 1 year but under 5 years.
- Psychiatric rehabilitative measures accentuated.

GUARDED PROGNOSIS.

38. Present offense—selling narcotic drugs.
39. Social adjustment poor both before and after addiction.
40. Total time served in previous sentences under 2 years.
41. Longest previous voluntary hospitalization for the treatment of addiction—under 1 month.
42. Home in an urban environment.
43. Has had a fifth to eighth grade education.
44. Explanation for use of drugs—relieve distress after alcoholic debauches.
45. Has used heroin, opium and morphine.
46. Longest period of abstinence following previous voluntary cure—under 1 month.
47. Duration of addiction over 20 years.
48. Inveterate gambler.
49. Economic status of parents—marginal.
50. Age when first arrested—20 to 29 years.
51. Explanation for relapse following prior treatments for addiction—to relieve distress after alcoholic debauches.
52. History of three or more voluntary cures in sanatoria or hospitals.
53. Sentence for current offense—3 years or more.
54. Physical examination shows presence of diseases of bones and cartilages or amputations.

B. The following criteria, in the order of significance, distinguish a poor from a good prognosis:

POOR PROGNOSIS.

1. Insight—believes drugs necessary for a satisfactory extramural adjustment.
2. Voluntary patient, discharged against medical advice.
3. History of 3 or more compulsory cures in jails or penitentiaries.
4. Insight—believes drugs beneficial but will remain abstinent because of fear of imprisonment.
5. Psychiatric classification—psychopathic personality.
6. Custodial officer's estimate of patient—disagreeable, constant complainer.
7. Antisocial tendencies in addition to violation of drugs laws.
8. Future plans—has a home in poor environment, no job or parole advisor.

GOOD PROGNOSIS.

- Insight—believes drugs are harmful from every standpoint—social, mental and physical.
- Occupational therapy—displays excellent knowledge of his work assignment.
- Institutional adjustment—very cooperative; abides by rules and regulations.
- No history of previous convictions.
- Attitude toward occupational therapy shows initiative; does more than requested of him.
- Future plans—has a good home to go to, a job and a parole advisor.
- Has never been off drugs since original period of addiction.
- Antisocial only as far as the use of drugs is concerned.

POOR PROGNOSIS.

9. Economic adjustment—resorts to illegitimate means of supplementing income.
10. Explanation for relapse following previous treatments—association with addict friends.
11. Occupational therapy—shows poor knowledge of work assignment.
12. Future plans—no home to return to, no job and no parole advisor.
13. Total time served in previous sentences—4 years, or more.
14. Has used cocaine in addition to other drugs.
15. Social adjustment poor both before and after addiction.
16. Occupational therapy—unable to do any work because of physical or mental status.
17. Delinquency record after addiction—history of convictions for offenses other than violation of drug laws.
18. History of three or more previous convictions.
19. History of two previous convictions.
20. Total time served in previous sentences—2 to 4 years.
21. Delinquency record after addiction—misdemeanors in addition to violation of drug laws.
22. Longest period of abstinence following compulsory cure—under 1 month.
23. History of incorrigibility or antisocial tendencies in childhood.
24. Minimum rehabilitative measures.
25. Duration of addiction—over 20 years.
26. Unpopular with fellow patients.
27. Brought up in a deteriorated neighborhood or slum section.
28. Attitude toward occupational therapy—unwilling, shirks work.
29. History of 3 or more voluntary cures in sanitarium or hospitals.
30. Chronological age—50 years or over.
31. Occupational therapy—knowledge of work assignment average.
32. Has no dependents; *i. e.*, wife or children.
33. Has used morphine, opium and heroin.
34. Economic status—marginal.

GOOD PROGNOSIS.

- No history of compulsory cures in jails or penitentiaries.
- No history of time served on previous sentences.
- History of violation of drug laws only.
- Psychiatric diagnosis—normal individual accidentally addicted.
- Duration of addiction—1 year or less.
- Brought up in a good neighborhood.
- Economic adjustment—history of steady employment.
- Reason for first arrest—violation of drug laws.
- Childhood adjustment—apparently normal.
- Custodial officer's estimate of patient—normal, pleasant and agreeable.
- No history of misdemeanors or minor violations of the law.
- Physical rehabilitative measures accentuated.
- Has used morphine exclusively.
- Well thought of by other patients.
- Economic status—comfortable.
- Explanation for use of drugs—therapeutic necessity for the relief of pain or physical discomfort.
- Social adjustment acceptable before addiction, poor after.
- Violation of drug laws other than possession or sale of narcotic drugs; *e. g.*, forging narcotic prescription.
- Mental age—12 to 15 years.
- Disposition first arrest—fine or probation.
- Familial relationships normal.
- Probationer patient.
- Economic status of parents—comfortable.
- No history of previous voluntary cures in sanitarium or hospitals.
- Social adjustment acceptable despite addiction.
- Custodial officer's estimate of patient—inclined to be quiet, but pleasant and agreeable.

POOR PROGNOSIS.

35. Heroin drug of choice.
36. Longest period of abstinence following previous voluntary cures—under 1 month.
37. Longest period of abstinence following previous voluntary cures—over 1 month, under two years.
38. Explanation for addiction—to relieve physical distress after alcoholic debauches.
39. Longest period of previous voluntary hospitalization for treatment of drug addiction—under 1 month.
40. Unusual attachment for mother.
41. Opium drug of choice.
42. Onset of addiction under the age of 30.
43. History of gonorrheal infection.
44. Has used both morphine and heroin.
45. Institutional adjustment—uncooperative, violated major institutional rules and regulations.
46. Institutional adjustment—uncooperative, violated minor institutional rules and regulations.
47. Drug first used—opium.
48. Inveterate gambler.
49. Duration of addiction—over 5 years, under 20.
50. Disposition first arrest—jail or penitentiary sentence.
51. As an adult lived in an urban environment.
52. Economic status of parents—marginal.
53. Extramural occupation—domestic and personal services.
54. History of 1 or 2 previous compulsory cures in jails or penitentiaries.
55. History of one previous conviction.

GOOD PROGNOSIS.

- Considered a leader by fellow patients.
- Duration of addiction—over 1 year but under 5 years.
- Age when first arrested—40 years or more.
- Two or more dependents; *i. e.*, wife and children.
- Custodial officer's estimate of patient—inclined to be over-talkative but pleasant and agreeable.
- Future plans—has a good home to return to, but no job or parole advisor.

C. The following criteria in the order of significance distinguish a guarded from a poor prognosis:

GUARDED PROGNOSIS.

1. Insight—believes drugs to be harmful from every standpoint—social, mental and physical.
2. Institutional adjustment—very cooperative, abides by rules and regulations.
3. Occupational therapy—shows a good knowledge of his work assignment.
4. Future plans—has a good home to return to, but no job or parole advisor.
5. Attitude toward occupational therapy shows initiative, does more than he is requested to do.

POOR PROGNOSIS.

- Insight—believes drugs are necessary for satisfactory extramural adjustment.
- Voluntary patient, discharged against medical advice.
- Brought up under poor discipline in childhood.
- Minimum rehabilitative measures.
- Custodial officer's estimate of patient—disagreeable, complaining.

GUARDED PROGNOSIS.

6. Physical rehabilitative measures accentuated.
7. History of drug violations only.
8. Custodial officers' estimate of patient—normal, pleasant and agreeable.
9. Prisoner patient.
10. Sentence for current offense—under 3 years.
11. Reason for first arrest—violation of drug laws.
12. Social adjustment acceptable before addiction, poor after addiction.
13. Well liked and respected by fellow patients.
14. Accepted as a member of the group by fellow patients.
15. Current offense—possession, purchasing and concealing narcotic drugs.
16. Current offense—selling narcotic drugs.
17. No history of previous neurotic or psychotic episodes.
18. Future plans—has a home to go to, a job, and a parole advisor.
19. Institutional adjustment—average cooperation, indifferent, does not violate institutional rules or regulations.
20. Insight—believes drugs are beneficial, but will remain abstinent because of fear of imprisonment.
21. Custodial officer's estimate of patient—inclined to be quiet, but pleasant and agreeable.
22. Mental age—12 to 15 years.
23. Childhood adjustment apparently normal.
24. Psychiatric classification—psychopathic diathesis.
25. Age when first arrested—30 to 39 years.
26. Attitude toward occupational therapy—willing worker, but shows no initiative, does only what he is told to do.
27. Disposition of first arrest—penitentiary sentence.
28. History of gonorrheal infection.
29. Has used morphine and heroin.
30. Has no religious preference.
31. Normal familial relationships.
32. Total time served in previous sentences—under 2 years.

POOR PROGNOSIS.

- Occupational therapy—knowledge of work assignment poor.
- Total time served in previous sentences—4 years or more.
- Social adjustment poor both before and after addiction.
- Institutional adjustment—uncooperative, violated major institutional rules and regulations.
- Occupational therapy—unable to work because of physical or mental status.
- History of previous neurotic or psychotic episodes.
- Unpopular with fellow patients.
- History of 3 or more previous convictions.
- Psychiatric diagnosis—psychopathic personality.
- Occupational therapy—unwilling, shirks work.
- Psychiatric rehabilitative measures accentuated.
- Duration of addiction—over 20 years.
- History of familial physical diseases such as tuberculosis, cancer, diabetes.
- Physical status—chronic invalidism necessitating infirmity care.
- Parental home uncongenial.
- Longest period of previous voluntary hospitalization for the treatment of addiction—under 1 month.
- History of incorrigibility and antisocial tendencies in childhood.
- Unusual attachment for mother.
- Onset of addiction under the age of 30.
- Brought up in Protestant faith.
- Marital status—single.
- Drug of choice—opium.

DISCUSSION.

DR. LAWRENCE KOLB (Washington, D. C.).—Dr. Pescor deserves much credit for bringing together some criteria by which we can more accurately prognosticate what is going to happen to our drug addicts. You will note that most of the patients he has analyzed have been prisoners, and we have been led to believe that it is difficult to treat a drug addict against his will. However, a great proportion of these people superficially want to get well.

We find that a large proportion of the drug addicts became such through first drinking alcohol, and we also know that lots of them after they are "cured" from the addiction, go back to alcohol. This is a change rather than a cure. You will no doubt be surprised to hear that as many as 30% of drug addicts are cured, especially the type that are treated at Lexington. Of course, Dr. Pescor would not claim, and I surely do not believe, that 30% are going to remain cured forever. Many of these people meet situations that will cause them to go back to narcotics.

A former patient called me up the other day from a distant city. He had been out more than two years; he had 3 or 4 penitentiary sentences; he was very carefully treated, and he is doing very well. He has a job, but he called me up and said, "I'm drunk; I got promoted and I went out to celebrate." That was the second time he called me up to say he was drunk. He is not a chronic alcoholic but obviously he has periodic spells in which he feels the need of something to relieve himself, but because of the penalty that is attached to addiction he sees that that won't do so he solves the difficulty by taking the alcohol instead of the drug. You can call that a cure, if you choose—the alcoholic receives much more approval from his environment because many of us are at least mildly alcoholic, and the drug addict knows that "that goes." The motive behind this cure, then, is largely a motive of fear and the notion that they can't get along as an addict. But the treatment given at Lexington does get a number of these people well.

There is another reason why the prognosis in drug addiction is better than the prognosis in alcohol and that is that the physical necessity created by drug addiction, by morphine and other opiates, is a thing that will afflict anybody. And therefore we may have a number of physical addicts who, if you once relieve them of this physical addiction and give them a reasonable chance to rehabilitate, are likely to stay well regardless of the treatment.

CHAIRMAN JAMES L. MCCARTNEY.—Roland Toms once said the morphine addict goes home and his wife beats him, while the alcoholic goes home and beats his wife.

The next speaker—and incidentally these contributions are from the Public Health Service; possibly some of you may not know that Dr. Kolb is the Assistant Surgeon General, U. S. Public Health Service, in charge of Mental Hygiene, and Dr. Reichard, the next speaker is in charge of the Institution in Lexington.

J. D. REICHARD (Lexington, Ky.).—I think it rather questionable how useful the practice of making a prognosis is. We all do it, we think it's the thing to do and in our work it is to a certain degree an administrative necessity. However, I think it should not be taken too seriously from the clinical point of view. It may be distinctly harmful. For example, if a poor prognosis is hung on to a patient, the attitude assumed toward that patient by the staff may be quite harmful. We are trying to guess what's going to be the outcome in the case. I hope we may develop some more accurate methods of guessing the outcome than have so far been developed. I hope some technique may be developed, for example, which will give us something objective, something we can measure, for example, the autonomic imbalance. No matter what the statistical analysis seems to indicate, I think the "good" and the "poor" classifications should be made rather small; I think the guarded should be made large. Dr. Pescor's analysis has been continued and we now have results on 3,000 patients up to July 1, 1939, patients who have been discharged. Some of those have been out 4 years or longer. The reports suggest that 32 and a fraction per cent of those patients have not yet relapsed.

THE CLINICAL VALUE OF HALLUCINATIONS IN LOCALIZING BRAIN TUMORS.*

By SIDNEY TARACHOW, M. D., NEW YORK CITY.

In a series of previous studies¹ at Mt. Sinai Hospital the attempt was made to find a correlation between the location of brain tumors and the type of abnormal mental experience, including hallucinations. This study is a further attempt to determine the degree of precision which various types of hallucinations may have in localizing brain tumors. The general tendency is to think in terms of specific anatomical centers, *e. g.*, formed auditory hallucinations as due to tumor of the temporal lobe and olfactory as due to lesions in the uncinate gyrus. The validity of this assumption will be tested in this study. A tumor may be not in, but near a particular center, and remote factors such as edema, hyperemia or toxemia may all play their parts in disturbing the functional stability of areas of the brain. This study is purely statistical, and no detailed individual case material will be given.

The incidence of hallucinations in patients with tumor of the brain is not low. Henry,² who collected 1000 cases of brain tumor with mental symptoms from the literature, estimated an incidence as high as 50 per cent. This does not really represent a true incidence because the cases he collected were not a single unselected consecutive series of brain tumors from one hospital, such as this study is based on. In the large series of cases studied by Keschner *et al.*, 103 of 530 patients exhibited at least one type of hallucinatory experience. The 401 supratentorial tumors of the group mentioned provided the material for restudy; to this group were added 57 subsequent cases of supratentorial tumor. In these 458 cases of supratentorial tumor hallucinations occurred in 96 instances: the tumors were all verified by necropsy or operation. Some patients had only one type of hallucination, others experienced more than one type. A tabular summary of all the tumors with their

*From the Neurological Service of Dr. I. S. Wechsler, Mount Sinai Hospital, New York City.

locations and the accompanying hallucinations is given in the Appendix to this paper.

The hallucinations are classified as auditory (formed and unformed), visual (formed and unformed), olfactory, tactile and gustatory. The order of incidence of the various hallucinations is as follows:

	Patients.
Auditory, unformed	40
Visual, unformed	23
Olfactory	20
Visual, formed	14
Auditory, formed	6
Tactile	6
Xanthopsia	3
Gustatory	3

AUDITORY HALLUCINATIONS.

Forty-five patients had formed or unformed auditory hallucinations either alone or in combination with other types of hallucinations. Formed auditory hallucinations were so classed when the patient described voices, melodies or music other than bell sounds. These hallucinations were rarely as elaborate as those seen in endogenous psychoses, and the patients usually had insight. Unformed auditory hallucinations were so classed when the patient described experiences such as grinding, roaring, buzzing, whistling, ringing, cracking or any monotonous meaningless noise. Patients with ear disease were excluded.

Formed auditory hallucinations occurred in 6 patients: the incidence of lobe involvement was as follows:

	Formed auditory alone.	Formed auditory with others.
Frontal .....	..	1
Temporal	1	3
Parietal .....	..	1
Occipital .....	..	..
Diffuse lesions .....	..	1
	1 patient	5 patients

The one case with formed auditory hallucinations alone was a pure temporal lobe lesion; of the 5 cases in which the formed

auditory hallucinations were in combination with other types of hallucinations, 2 were pure temporal lobe lesions and 1 was fronto-temporal; the other 2 were a pure parietal lobe lesion and a case with diffuse lesions. The temporal lobe was involved in 4 of the 6 instances; the occipital lobe was spared.

Unformed auditory hallucinations occurred in 40 patients: the individual lobe involvement was as follows:

	Unformed auditory alone.	With others.
Frontal	12	2
Temporal	10	3
Parietal	8	..
Occipital	2	1
Diffuse	1	..
Pituitary	5	3
Pineal	2	..
Third ventricle .....	..	1
	31 patients	9 patients

Frontal and temporal lobe lesions appear most frequently, though parietal and occipital lesions appear in descending order. There were unformed auditory hallucinations in 8 cases of pituitary tumor, as well as in a few cases of pineal and third-ventricle lesions. In the lobe lesions the hallucinations tended to be heard on the side of the lesion.

VISUAL HALLUCINATIONS.

Forty-three patients had formed or unformed visual hallucinations either alone or in combination with other hallucinations. Formed visual hallucinations were so considered when the patient saw animate objects or systematized visual images. Unformed visual hallucinations were so classed when the patient saw dots, spots, flashes, streaks, circles or other unsystematized visual images. The incidence of choked disc as a factor was no higher in this group than in the total series of patients. Xanthopsia was considered to be present when a patient's normal vision was perceived as colored not according to fact.

Formed visual hallucinations occurred in 14 patients: the incidence of lobe involvement was as follows:

	Formed visual alone.	Formed visual with others.
Frontal	1	2
Temporal	1	4
Parietal	4	..
Occipital	3	1
Hemisphere	1	..
Optic chiasm	1	..
Diffuse .....	..	1
	8 patients	6 patients

It will be noted that all the lobes of the brain are involved almost equally, the temporal most often.

Unformed visual hallucinations occurred in 23 patients; the incidence of lobe involvement was as follows:

	Unformed visual alone.	With others.
Frontal	1	2
Temporal	3	4
Parietal	3	3
Occipital	1	3
Thalamus	1	..
Pituitary	1	..
Diffuse lesions	2	1
Third ventricle	2	..
	11 patients	12 patients

The lobe distribution is again widespread, temporal and parietal being most frequently implicated.

Xanthopsia occurred in 3 patients.

	Xanthopsia alone.	With other hallucinations.
Occipital	1	1
Diffuse lesions	1	..

Two of these three cases occurred in pure occipital lobe lesions; the third occurred with diffuse involvement of the brain.

Visual hallucinations, not specified as to type, occurred in 4 patients. The incidence of lobe involvement was as follows: frontal 2, temporal 3, parietal 1, occipital none, diffuse involvement 1.

OLFACTORY HALLUCINATIONS.

Olfactory hallucinations occurred in 20 patients, either alone or in combination with other hallucinations. They were characteristically unpleasant, being described as some musty, garbage, fecal or other disagreeable smell. The frequency with which the various lobes were involved was as follows:

	Olfactory alone.	Olfactory with others.
Frontal	5	2
Temporal	6	7
Parietal	3	2
Occipital	1	..
Hemisphere	1	..
Sphenoid ridge	1	..
Pituitary .....	..	1
	11 patients	9 patients

The temporal lobe is obviously involved most, though the frontal and parietal lobes were also significantly implicated. In this group 7 were pure temporal lobe lesions, 5 involved the temporal plus an adjacent lobe, and 5 cases spared the temporal lobe, though the lesions were in adjacent lobes.

TACTILE HALLUCINATIONS.

The data concerning tactile hallucinations are perhaps the least reliable presented, since it was difficult to separate hallucinatory phenomena from the various perversions of sensation and from various types of Jacksonian sensory fits, many of which occurred in relation to convulsive seizures. There were many such which were not considered hallucinations. Tactile hallucinations were so considered when the unreal sensory experience was considered by the patient as coming from an external source and when the involved skin area was at rest. The few cases so selected were largely related to the auras of convulsive seizures. Numbness or quantitative and qualitative sensory disturbances were not included.

Tactile hallucinations occurred in 6 cases; the incidence of lobe involvement was as follows:

	Tactile alone.	Tactile with others.
Frontal	3	1
Temporal	1	1
Parietal	2	1
Occipital .....	..	..
	4 cases	2 cases

The occipital lobe was spared; the frontal, parietal and temporal lobes were involved in descending order.

GUSTATORY HALLUCINATIONS.

Three patients experienced gustatory hallucinations either alone or in combination with other hallucinations. The nature of the hallucinations was that of some peculiar unusual taste. The three cases were the following:

1. gustatory alone Fronto-temporal lesion
2. gustatory and olfactory..... Temporal lesion
3. gustatory, olfactory, tactile and visual..... Parietal lesion

It will be noted that of the 3 cases 2 were associated with olfactory hallucinations, and that the temporal lobe was involved twice.

PURE LOBE SYNDROMES.

The cases in which the tumors were confined to a single lobe, and the incidence of the various hallucinations produced by these single lobe lesions are presented in the following table:

	Frontal.	Temporal.	Parietal.	Occipital.
Auditory unformed	9	8	2	..
Auditory formed .....	..	3	1	..
Visual unformed	2	2	2	2
Visual formed	1	2	1	2
Visual unspecified .....	..	1	..	..
Xanthopsia .....	..	..	..	2
Olfactory	2	7	2	..
Tactile	1	..	2	..
Gustatory .....	..	1	1	..
	13 cases	16 cases	8 cases	4 cases

The *frontal* lobe shows a high incidence of unformed, but no formed auditory hallucinations; there is a low incidence of formed and unformed visual and olfactory hallucinations.

The *temporal* lobe shows a high incidence of unformed auditory and olfactory hallucinations; there is a low incidence of formed auditory and formed and unformed visual and gustatory hallucinations. In comparison to the other pure lobe syndromes there is a relatively high incidence of formed and unformed auditory, olfactory and gustatory hallucinations. It should be noted that although the temporal lobe gives rise to a relatively high incidence of olfactory and unformed auditory hallucinations, the frontal and parietal lobes may also be related.

The *parietal* lobe gave rise to the widest variety of types of hallucinations; the temporal lobe is next, and the frontal and occipital follow in descending order. It might be noted that the parietal and temporal lobes are the two centrally located lobes, with the frontal and occipital at either end. In comparison with the other pure lobe syndromes there was a relatively high incidence of tactile hallucinations.

The *occipital* gave rise to the least variety of types of hallucinations, only visual, with an equal distribution between formed and unformed and xanthopsia. It should be noted that while pure occipital lobe lesions gave rise to only visual hallucinations, the visual hallucinations, both formed and unformed, were found with lesions spread almost equally throughout all the lobes of the brain, the temporal predominating.

LOBE INVOLVEMENT IN THE ENTIRE SERIES OF SUPRATENTORIAL TUMORS.

The incidence of lobe involvement in the entire group of 458 tumors is expressed in the following table:

Frontal.	Temporal.	Parietal.	Occipital.	All others.
152	156	137	51	61

The temporal is the lobe most frequently involved. This would tend to make the higher incidence of temporal lesions in some of the groups considered of less significance, since it is the lobe most generally involved in the total distribution of all the tumors.

SUMMARY.

One or more types of hallucinations were experienced by 96 out of a group of 458 cases of supratentorial brain tumor. Formed auditory hallucinations were related predominantly to temporal lobe lesions, though the frontal and parietal were also involved. Unformed auditory hallucinations were related predominantly to frontal and temporal lesions, though all the lobes were involved as well as midline lesions notably the pituitary: in lobe lesions the hallucinations were usually on the side of the lesion. Although pure occipital lobe lesions gave rise to only visual hallucinations, either formed or unformed or xanthopsia, formed and unformed visual hallucinations were related to lesions in all the lobes of the brain in almost equal distribution, the temporal showing a slight predominance. Xanthopsia seemed related to occipital lobe lesions. Olfactory hallucinations were related to lobe lesions throughout the entire brain, though mainly to the temporal, with frontal and parietal next in descending order. Tactile hallucinations appeared with lesions of the frontal, parietal and temporal lobes. Although the parietal lobe gave rise to the widest variety of types of hallucinations, pure parietal lobe lesions gave rise to a relatively high incidence of tactile hallucinations. Gustatory hallucinations tended to appear together with olfactory hallucinations and to be related to temporal lobe lesions. It was noted that the temporal was the lobe most frequently involved by all tumors, and that the parietal and temporal are the two centrally located lobes in the brain. The occipital lobe seemed most restricted to only visual hallucinations.

Though there are tendencies for certain types of hallucinations to be predominantly related to certain lobes of the brain, these hallucinations also tend to be caused by adjacent or distant lobes.

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APPENDIX.

	Frontal.	Fronto-Parietal.	Fronto-Temporal.	Fronto-Tempo-Parietal.	Parietal.	Parieto-Temporal.	Temporal.	Temporo-Occipital.	Parieto-Occipital.	Occipital.	Parieto-Tempo-Occipital.	Diffuse.	Hemisphere.	Thalamus.	Sphenoid Ridge.	Pituitary.	Pineal.	Optic Chiasm.	Third Ventricle.	Totals.
Olfactory.....	2	1	1	1	1	1	2	1					1		1					11
Olfactory. Auditory, formed.....					1															1
Olfactory. Auditory, unformed.....							1										1			1
Olfactory. Gustatory.....							1													1
Olfactory, visual, formed.....			1																	1
Olfactory, visual, formed. Auditory, unformed.....							1													1
Olfactory, visual, unformed. Auditory, unformed.....																	1			1
Olfactory, visual, unformed.....							1										1			1
Olfactory, tactile.....			1																	1
Olfactory, visual, formed. Auditory, formed, unformed.....							1													1
Olfactory, tactile. Gustatory, visual, unformed.....					1															1
Gustatory.....						1														1
Xanthopsia.....		1								1			1							1
Xanthopsia, visual, unformed.....										1										1
Visual, formed. Auditory, formed.....			1																	1
Visual, unformed. Auditory, formed.....							1													1
Visual, unformed.....	1				1	2		1					2	1			1		2	11
Visual, formed.....	1									2	1			1			1		1	6
Visual, not specified.....			1	1			1						1					1		4
Visual, formed, unformed.....										1										1
Visual, unformed. Auditory, unformed.....	1		1							1							1			5
Visual, formed, unformed. Auditory, formed.....																				1
Auditory, unformed.....	7	4	1		2	1	5	1			1	1				5	2			30
Auditory, formed.....							1													1
Tactile.....	1	1	1		1															4
Not specified.....					1		1								1					3
Totals.....	13	6	9	2	8	4	16	3	3	4	1	6	2	2	1	10	2	1	3	96

THE INFLUENCE OF THE TIMES UPON THE
TEACHING OF PSYCHIATRY.

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The instruction of the psychiatric worker, at all times a matter for serious consideration, has in these years come to assume great and indeed grave importance. It is always desirable that we should arrange from time to time to take stock of what we are passing on to those who will succeed us. The present is a most fitting hour for us to discuss and debate what we are to teach. Clearly those whom we are now instructing must contend tomorrow with problems which were barely germinant when we first studied the field but which are now emerging in vital form.

As we approach our task we are met by the inescapable fact that, as in all years past, what is taught is influenced in greater or lesser degree by the times in which the teacher lives.

The vast explosion of the French Revolution lit a conflagration which, consuming much of the ideational structure of the 18th century, loosed a great flow of intellectual activity streaming into new moulds and forms down every way of life.

Those ideas concerning the supreme importance of the individual, which were then considered so dangerous and which now appear likely to be so considered once more, penetrated even into the hitherto dormant field of psychiatry to find their expression in the humanitarian teachings of Pinel and Tuke.

Nietzsche's considerations upon the transvaluation of values in the moral sphere were the forerunner of a tremendous reassessment, carried out under the leadership of Freud, of those concepts of will, of reason and of conscience which so dominated our earlier thinking. Nietzsche's speculations in other fields of ethics appear to have found practical realization in social philosophies which are reshaping the ways of living of vast numbers of people.

Similarly the psychobiological and psychosomatic concepts which

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have greatly influenced our teaching did not assume form out of thin air but have their roots in a time when Stanley Hall and Dewey were already urging the unity of the organism.

In lesser degree our teaching is influenced by all great advances in the field of medicine. The development of the microbic theory made possible the work and postulates of those who urged focal infection as a fruitful cause of mental disorder. We can now see that so far as its primary direction was concerned this trend was unfruitful. It has however had secondary effects of a most beneficial character upon our teaching. It has brought before the student the necessity of the closest scrutiny not simply of the mental health but of the total health of the individual, and it must moreover be considered one of the roots of the psychosomatic movement.

In considering the influence of our own days upon the teaching of psychiatry we must keep before us a statement of what we are in our professional quality. Traditionally we consider ourselves physicians and that we are. But we have become, I think, more than that. The change has come about insensibly. At the outset the psychiatrist was essentially a medical man in charge of the mentally sick patients in a hospital. From consideration of the early issues of our journals you will see to what an extent such men were concerned about the general health of their patients, about the ever recurrent epidemics of typhoid and the high death rate from tuberculosis. At the time when the *AMERICAN JOURNAL OF PSYCHIATRY* was founded, nearly a century ago, few of the problems which are now debated appeared in its pages; and it seems reasonable to think that many of them would have been rejected by the psychiatrists of those days as lying outside their province.

Gradually this has changed. With the rise of the mental hygiene movement, the growth of extra-mural psychiatry, and the interest in the preventive side of mental ill health we have come to enter into wider and wider fields. As we have moved out of the nineteenth century into these first crucial decades of the present century the speed of social change has entered upon a vast crescendo, the scope and ends of which we cannot now foresee.

Today we concern ourselves with education, with delinquency, with men in industry and men at war. Tomorrow it may be that

the development of our work will lead us to concern ourselves not only with social attitudes but with matters of social organization and functioning.

We may see ourselves then as finding our support both in the work which is being carried forward in the great medical centers, and also in the knowledge which is being won in the many fields of social science. We are and must be responsive to changes and advances which are made in both spheres of human activity.

In which of these spheres are the events of greatest moment for us taking place? This may be answered by stating that there have been few hours in history when men have so urgently sought for an understanding of social behavior and for means to insure its guidance and control. For lack of that knowledge we are in grave danger of perishing in the great social breakdowns which are appearing in constantly widening areas throughout civilization.

Let me then state that the demand which our times make upon us is that we should teach to the best of our ability a company of men and women who will be fitted to undertake leadership in the working out of the vastly different ways of living which will lead from our times into the future. While those whom we teach must and will as physicians continue to be profoundly concerned with the ills of individual patients it seems probable that the most urgent calls upon them will be from the field of group and community living.

What must we do to facilitate the entry of the next group of workers into this new field of social organization? First as to our social tools, are they adequate? Among these tools we must reckon not only those concepts which we employ to convey meaning and those which have been embodied in technical procedures but also those which have found expression in structures and organizations such as our hospitals, clinics and societies.

Some of our social tools like certain of our statistical methods carry with them a hidden bias. They distort reality. At an earlier period in our teaching the hospital was considered the natural center in which instruction was to be carried on. The hospital is clearly an excellent place to study much of medicine. Can that be said with equal truth about its suitability for the study of social behavior?

Consider our large hospitals located in urban areas. Patients come into their admission wards from a background unclearly apprehended as the city or perhaps another state. For the student or the intern the new admission is and often remains simply a sick man whom he finds in bed on his morning rounds. The worker long resident in the hospital or the man engaged in community research may know something of the characteristics of the group and of the community from which the patient comes and in which he has broken down. The young man in training knows little or nothing of the region in which his hospital is located.

In consequence the worker in training tends to regard the patient as an isolated individual, an attitude which is rendered only too easy since that is the way in which general medicine, save in times of epidemic, tends to regard its patients.

The general medical man in dealing with the patient who is suffering from a gangrene of the leg or the woman who has an acute abdomen is working at levels which are little affected by the nature of the social environment in which the individual lives. Within limits the course of the gangrene and the development of the acute abdomen will proceed uninfluenced by the question of whether or not the patient is living in an area having a high index of social breakdown, or whether he is well integrated in his group.

The psychiatric worker, because of his concern with the total individual, must frequently encounter his problems at levels at which the individual blossoms up into that vast and intricate network of interrelationships with other individuals which constitutes the community. This must at once call for a series of fresh viewpoints. It is clear that to understand the sick individual the psychiatric worker must also have information concerning the nature of the environment from which he comes. Indeed it is certain that we should better understand those countless individuals who stream into our hospitals and clinics if we considered them not as isolated units but as indices of the health or lack of health of the community from which they came. At present we see those patients who enter hospitals suffering from abnormal degrees of tension simply as individuals who have not adequately balanced within their own lives, work against relaxation, sensitivity against matter-of-fact acceptance. We do not grasp the fact that as com-

munities are under greater social pressure this is certain to be reflected in increased evidences of tension in the behavior of those individuals who live within such communities. Similarly where social disintegration is occurring at accelerated rates in local areas, the individuals who live in those areas will certainly show the effects of this in the form of a higher incidence of behavioral disorders. It is most important for the development of our concepts of teaching that we should grasp this basic fact, namely that the behavior of the individual is of necessity profoundly affected by those larger and more sweeping fluctuations which occur in the community within which he lives. This is at present almost entirely obscured by the fact that we mistakenly continue to study and work with the patient as though he were an isolated individual.

Here then we see the disturbing influence present in one of our major social tools. The psychiatric hospital itself tends to preserve the illusion originating in the general medical curriculum that the individual is an independent unit.

The hospital, more particularly that adapted to the long term care of patients, produces a further distortion in the thinking of those taught therein. In spite of our efforts it still seems largely true that patients are brought to mental hospitals not when they first show evidence of illness but only when it becomes clearly impossible to keep them longer at home. Teaching carried out on the basis of such clinical material must and does color the concepts which the younger worker entertains concerning the nature of abnormal human behavior. It lays emphasis upon the fully developed, chronic and relatively irreversible reaction as the exemplar of mental illness and consequently tends to perpetuate in the mind of the young worker the idea that it is only this type of behavior which can properly be designated as psychiatric and therefore worthy of study and treatment.

If we accept these criticisms as valid it is clear that we have to work out additional tools to aid us in the teaching of workers who are to be extensively occupied in the community. Beginnings have already been made in the utilization of outpatient departments and in the growing collaboration within the various agencies which undertake field work in the community.

We must now turn our attention to a bias which is closely associated with our training centers considered as social tools. The

distorting influence which it exerts upon the results of our teaching is one which is already to some extent known; but it has not been, I believe, previously brought forward for frank consideration.

I have reference to the undue influence which many teachers exert upon the thinking of their students. The young man who as a student is introduced into psychiatry by the teacher under whom he subsequently works as an intern and resident is only too often a young man who will not be able to steer his intellectual craft towards new discoveries but will, following a course already set for him, spend his best years rediscovering the already known.

The amount of devoted time and determination spent by former pupils in running down through the years the *obiter dicta* of the earlier workers in the field is a matter which turns tragic in the light of our need for fresh thinking, fresh ideas and fresh facts.

There are those, of course, for whom progress is impossible save in terms of refuting and overturning the very things upon which they have climbed to gain their present view-point. That is a wasteful procedure. What we want is clear minds which owe no mortgages to the past but can assess and utilize what was valuable in the work of their predecessors. The times lay an imperative demand upon us that we produce workers and not pupils.

To meet this situation further study of the psychology of apprenticeship is required. Up till two or three years ago this tendency to domination was mitigated by the fact that the abler men sought additional training abroad. Now that this is impossible a system of internal migration could well be fostered and it might reasonably be a requirement for acceptance for examination by the American Board of Neurology and Psychiatry that a man should have had training in more than one center.

We have considered then certain of the biases which lie concealed in our social tools. Further search will almost certainly show others. Their correction will lend strength to our purpose to teach workers who will be able to deal with the great social developments of the coming days.

Still other preparations require to be made. We must undertake not only the reconditioning and modernizing of those social tools which we already possess, but we must also raise for consideration the important question of whether the whole framework

upon which we rest our teaching should not be extensively reorganized and expanded.

Let us state that a training which is limited to experience in abnormal human behavior is inadequate for our purposes as we conceive them, namely, the preparation of workers fitted to grapple with problems arising throughout the whole field of human behavior. For this it is necessary that the worker should be grounded in the entire range of the sciences which deal with human activity.

It would have been idle to suggest this even a few decades ago, when the sciences of human behavior in their early attempts to define the field were preoccupied with such diverse and often unreal problems that there almost seemed reason to doubt whether ultimate agreement could be obtained.

Since then the great and weighty problems of human living have exerted an inevitable pull upon the thinking of the workers in the whole series of social sciences and in consequence there has been taking place a general gravitation of interest towards the same great questions.

We propose, then, to advance the contention that the demand for control of social reactions which is already apparent and which may reasonably be expected greatly to increase, could be much more adequately met if this movement towards a community of interest were finally organized into some form which could be utilized in the teaching of coming workers in the field of human behavior.

We have long been acquainted with the fact that the ordinary medical curriculum has been able to bring together biochemistry, anatomy, physiology, histology and a host of allied sciences within a simple integrated organization for teaching. Can we achieve the same thing with respect to the social sciences? Is it possible for us to think in terms of setting up Departments of Behavior rather than Departments of Psychiatry and in terms of teaching the fundamentals of human nature in place of the data of rather artificially classified diseases? Certainly those who would take major responsibility in such departments must of necessity be those who are most extensively trained in the functioning of the human organism, but undoubtedly the preparation of workers to enter the wider field of group and community behavior would be greatly strengthened by bringing in the other social sciences.

With such a department a range of teaching could be undertaken which is now impossible. Workers who enter a psychiatric training center today find a vast array of the case histories of those innumerable individuals who have been studied in that particular center. They will not find a case history of the community from which these individuals come. It is still impossible to state that the characteristic of this training center is that it serves a community in which social breakdown has been increasing due to cultural conflict, that the characteristics of another are that it is located in an area where rapid urbanization is going on or that a third center is of special importance because of a static population associated with cultural lag. It is easy to see that when it is possible to state in detailed terms the nature of the community where the training center is located, it will also be possible to designate the particular type of training and experience which such a center can best undertake.

Now we have considered both the influence of the times upon our teaching and certain reorganizations of the mechanics of instruction which have to be made in order that we may meet the new demands most adequately.

We have next to turn our attention to the general outline of those new things in which the student is to be instructed. We are training not only psychiatric workers but also those who will interest themselves mainly in the general practice of medicine. We must therefore assure ourselves that our purpose to broaden the field of training must be advantageous to both groups. This question may readily be answered by considering the major behavioral problems which the general practitioner meets most frequently. It may be stated at once that they are seldom those which he encounters during his training in medical school. He sees only rarely in his subsequent practice a classical case of schizophrenia or general paresis, but he is involved every day in situations in which a knowledge of human nature is essential. This knowledge is still imparted in the majority of our training centers only infrequently and incidentally. By bringing into his training, then, information as to how individuals live together in families, in groups and communities we shall go far to supplant the inherited folklore which is often his only standby in attempting to meet human situations.

How should our outline of instruction for the coming workers in the psychiatric field be devised? Let us state at the outset that much of the information which we possess about the human organism as an individual is at least of current value and must be passed on. What we know regarding the abnormal reaction types, while undoubtedly very limited and quite probably faulty, represents the best which it has been possible to achieve and must not be discarded.

What we are now concerned with is the broadening of instruction to permit training of workers who will be capable of dealing not only with the individual but also with the group and the community.

When we consider the nature of the instruction which is necessary for this purpose we must bear in mind that there are basic features of community and social life which are found throughout a great range of contemporary and antecedent cultures. In addition there are certain profoundly important social trends which have arisen during our times, are characteristic of our culture and which are potent factors in the health of those who live within the culture.

Among the first, more enduring phenomena of social activity is the simple fact that the individuals who form a group or community are fundamentally social rather than isolated organisms. It is most desirable that the student should have repeatedly placed before him such primary facts as that the individual possesses many attributes, such as the function of language, of reproduction and those patterns of behavior associated with the rearing of children, which are meaningless save where interaction with other individuals in group life is possible.

The structure of the family unit shows some variation between cultures but is sufficiently enduring to be considered as falling into the group of basic data. We have already begun to appreciate the value of this social form as affecting the wellbeing of its members. As a training group and as the means whereby social attitudes are passed on its importance can hardly be overemphasized.

The structure of play and community groups, the nature of stable and disintegrating groups, the relationship of leader to group, are all matters regarding which the social sciences have begun to assemble data of the utmost importance in the instruction of the

young psychiatric worker. These, then, are certain of the things which are characteristic of social living in general.

Our own times, however, represent a period during which more extensive dislocation and disintegration of social forms have occurred than at any time save perhaps when the era of the Roman Empire was merging into the Middle Ages. It may justly be claimed, moreover, that the rapidity with which these changes are taking place greatly exceeds that with which the Roman world state gave way to nationalistic feudalism.

What are the special characteristics of our culture with which our successors must be equipped to deal? It is reasonable to state that, as far as we can at present grasp the factors, the fundamental impetus for the social breakdowns of our times originates from the great acceleration of invention in the basic, derived and applied sciences and the lag in social invention. From this stem certain major trends with which the student must be acquainted.

As a direct consequence of the speed of material invention and the lag in cultural evolution there exists a constant clash between social attitudes and actual practice, between ideals and common usage. From this issues a great stream of dissatisfactions, of frustrations, of guilt reactions and of inadequate compromises.

One may illustrate this by pointing out that material invention has resulted in great industrial developments in urban areas. These have drawn in large numbers of the younger members of rural families. In consequence the family unit in these areas is less able to carry out one of the functions which long custom has ascribed to it, namely, the support and protection of its aged members. The final link in this chain of events is a further increase in senile breakdown rate due to social insecurity of these older people and to their failure to adjust to living alone or in the homes of strangers.

A further illustration is provided by the fact that while social tradition continues to uphold chastity, material invention has produced an ease of transportation, an anonymity in our urban areas and a range of prophylactic and contraceptive agents which remove many of the penalties from infraction. We are only too familiar with the stresses which are imposed upon the individual by the frustrations and the guilt reactions which arise from this conflict.

A second major trend which arises from the unequal productivity in the fields of material and social invention is the rapid breakdown in social forms. This breakdown, occurring in the absence of planned and prepared social adaptation, is of necessity accompanied by a great rise in the level of social insecurity which reflects itself in varying forms in the individual members of the culture.

This is well demonstrated by the fact that material invention has resulted in a great reduction in the cost of transportation. In consequence much larger markets are possible, and therefore the size of industrial organizations has increased enormously. As these have grown the importance of the individual employed therein has diminished proportionately. Formerly it was possible for the skills and abilities of the individual worker to be known throughout a small business organization, and a man could feel that he was a meaningful part of the activity in which he was engaged. This has now become impossible, and proposals vitally affecting his affairs may be made by individuals who know nothing of him or of the consequences to him of their decisions. It has become a matter of pride to state that no man is indispensable. This may be so but it does nothing to increase the sense of security of the individual.

Consideration of contemporary cultures shows that where the degree of danger and of social pressure increases there is a general tendency to increase group solidarity at the expense of individual activity. We are already aware of the effects of this upon initiative and invention. Circumstances have as yet prohibited attempts to assess the effects of this suppression and limitation upon the well-being of the individual. Nonetheless one of the most urgent problems before the worker in the field of social science must be that of working out means whereby the maximum group solidarity may be attained with the least diminution of individual initiative.

These then are certain of the social trends which are representative of our times. Many more can be mentioned—the growth of aggression, the rising numbers of the aged for whom there is little place in our social philosophy and the vast loss of satisfaction in work which the fractionization of production has wrought. It is upon these and similar facts that the times are demanding that we build our teaching.

Our work found its origin in problems which we met in hospitals. Through the brief and hurrying course of our development we have continually extended our enquiries further outward into the community. Now we and the other social sciences are being drawn into a community of effort born of the urgency of the times. Our immediate task is to foster this cooperation, to devise means whereby we can jointly train workers who will be fitted to deal with these vast social problems—with the insecurities, the frustrations and the aggressions which are already presenting themselves and which will become the more prevalent and pressing as the social breakdowns of our times spread and deepen.

That they are spreading is a matter of day to day record, that means can be found to master and control them may depend, in a measure which we cannot now foretell, upon the competence with which we endow our successors in the field of human behavior.

ALCOHOLISM: SOME CONTEMPORARY OPINIONS.*

By MERRILL MOORE, M. D., BOSTON, MASS.

A symposium on alcoholism was held in Philadelphia, December 27-29, 1940, during the annual meeting of the American Association for the Advancement of Science, sponsored by the Research Council on Problems of Alcohol. At the final public meeting Dr. Thomas Parran, Surgeon-General of the United States Public Health Service, presided and Dr. Abraham Myerson, director of psychiatric research at the Boston State Hospital, delivered the main address. All sessions were well attended by physicians, psychiatrists, sociologists, lawyers, members of the clergy, and others.

The program was planned to cover all aspects of the alcohol problem, beginning with physiological, chemical and clinical aspects on the first day; the neuropsychiatric features, treatment and prevention of alcoholism on the second day; and social and legal problems on the third day.

In his introductory remarks, Dr. Winfred Overholser, superintendent of St. Elizabeth's Hospital, Washington, D. C., described the nature and extent of alcoholism. He cited illustrative statistics and, as one of the founders, outlined the history and aims of the Research Council on Problems of Alcohol, as well as the purpose and plan of the symposium. Dr. Overholser stated:

Although the enlightened of today recognize excessive and prolonged use of alcohol as a disorder of conduct, a disease, in some instances at least amenable to treatment, it is a fact that throughout the United States, with the exception of the large cities, practically the only institution in which an acutely intoxicated person may be cared for is the local jail. . . . It is extremely difficult to say just how many alcoholics there are at the present time in the United States. The statistics of arrest indicate that annually well over 100,000 persons are arrested on a charge of drunkenness, about 27,000 on a charge of driving an automobile while under the influence of

*A Report on the Symposium on Alcoholism of the Research Council on Problems of Alcohol, at the annual meeting of the American Association for the Advancement of Science, Philadelphia, Pa., December 27, 28 and 29, 1940.

liquor, and about 27,000 on a charge of disturbing the peace, an offense often associated with over-indulgence in alcohol. In addition, over 4,900 persons were committed to mental hospitals in 1938 by reason of alcoholic psychosis and nearly 7,600 for alcoholism without psychosis; statistics are not available as to the number admitted to the alcoholic wards of the various municipal hospitals. . . . Thus, with tuberculosis, cancer, syphilis, mental disease and infantile paralysis receiving competent and intelligent medical attention, we now have alcoholism as the greatest public health problem at the present time which is not being systematically attacked.

In the session on physiological and chemical features of alcoholism Dr. A. C. Ivy of the Northwestern University Medical School spoke on "The Influence of Alcohol on the Alimentary System." He reported a study on the effect of alcohol on the motility of the colon and the secretion of bile. In dogs, he found that alcohol given by any route in amounts sufficient to produce moderate intoxication tended to depress the non-propulsive and to augment the propulsive motility of the colon. Dr. Ivy felt that these observations provided an explanation for the irregular relief of colonic colic after ingestion of alcohol and the tendency of alcohol to cause diarrhoea in certain individuals.

Dr. F. A. Hitchcock of the department of physiology of Ohio State University reported on "The Alterations in Respiration Caused by Alcohol." He had found that alcohol seems to accentuate normally occurring peculiarities in breathing as well as to produce a more rapid and often shallower type of respiration. In many cases there was an increase in the total pulmonary ventilation which might be interpreted as a stimulation of the respiratory center by alcohol.

"The Hypoglycemic State in Alcoholism" was the title of a paper by Dr. H. D. Palmer of the Institute of the Pennsylvania Hospital. Dr. Palmer reported a number of cases in which alcoholism was a prominent symptom; he found that a number of them showed an atypical carbohydrate metabolism as indicated by their sugar tolerance curves. Regulation of the diet tended to correct this condition in certain cases by stabilizing the carbohydrate metabolism and energy expenditure and resulted in some relief of the symptoms of drinking.

Dr. Henry Newman of Stanford University School of Medicine discussed "The Problem of Acquired Tolerance to Alcohol." The hypothesis that delayed absorption of alcohol might be responsible

for increased tolerance was found by Dr. Newman to be inadequate, nor could the possibility of delayed penetration of alcohol into the nervous system serve as an explanation of variations among different individuals. Actual tolerance to alcohol, according to Dr. Newman, if it can be acquired, must depend upon tissue tolerance or to a difference in the behavior of the cells of the central nervous system to a given quantity of alcohol as compared with similar reactions in non-habituated subjects.

A paper on "The Effect of Alcohol on the Electroencephalogram" was presented by Dr. Hallowell Davis of the department of physiology of the Harvard Medical School. This work had been done in collaboration with the department of neurology and the neurological unit of the Boston City Hospital. Dr. Davis, Dr. Frederic Gibbs and their associates studied the encephalographic tracings of six men to whom a measured quantity of alcohol had been given (2 cc. per kg. of body weight). Psychometric examinations were made by Mr. Lowell S. Trowbridge and blood alcohol determinations were made at intervals throughout the experiment. A spectrum analysis of several of the records by means of the Grass analyzer showed a reduction in energy on the fast side of the frequency spectrum, particularly in the range from 10 to 13 cycles, at relatively low concentrations of alcohol. At higher concentrations of blood alcohol, there were episodes of slow waves (4 to 8 cycles) which intruded into the subjects' characteristic EEG pattern and appeared in the spectrum analysis as an increase in energy in the corresponding frequency band. The performance on the psychometric tests, particularly the addition of consecutive digits, the reversed clock problem and the strength of grip were definitely impaired while the concentration of blood alcohol was at its height (125 to 140 mgs. per 100 cc.) and for an hour thereafter, but became approximately normal in four or five hours.

Dr. Curt P. Richter of Johns Hopkins Medical School reported a series of feeding experiments in which the value of alcohol as a food was considered. The study indicated the concentrations of alcohol which were acceptable to the animal subjects and permitted the exercise of choice by them. Dr. Richter's observations indicated how psychological elements may operate in the choice of beverages.

Experimental studies of the effect of alcohol on the circulation described by Dr. Arthur Grollman of Johns Hopkins Medical School showed that it actually exerts only a minor effect on the circulation and this does not reflect any significant change in cardiac activity. The isolated heart is not affected by concentrations which might be encountered in a human subject. Alcohol causes an increased circulatory activity in the normal human subject but the magnitude of response is so small that a stimulant action on the circulation cannot be inferred. The apparent stimulating effect of alcohol in conditions involving circulatory insufficiency is probably due to reflex stimulation of the gastrointestinal tract.

Dr. M. Geneva Gray of the Harvard Medical School discussed "The Effects of Stimulants of Cellular Oxidation on Alcohol Metabolism," especially the higher homologues of dinitrophenol. These compounds had been studied by Heymans, who suggested that they might be more active and less toxic than the latter substance with respect to the stimulation of cellular metabolism. In Dr. Gray's experiments the blood alcohol concentration of animals who had been given a measured amount of ethyl alcohol by mouth was determined at intervals during three hour experiments and the same procedure repeated about a week later, at which time one of the higher dinitrated phenols was administered in addition. Dinitrocyclohexylphenol, dinitrothymol, dinitroorthocresol and sodium dinitroorthocresol were found to increase the oxidation of alcohol in cats. They were also found to be effective in increasing the *in vitro* oxidation of alcohol in the presence of fresh liver and muscle tissue, but to a lesser degree. Because of the potential toxicity of these drugs, Dr. Gray stated they cannot be recommended for use in human subjects, but the results suggest a pharmacological approach for the treatment of acute alcoholism. It is possible that if the undesirable side actions might be eliminated or attenuated by synthetic techniques, substances of this general type might be utilized in active therapy.

A paper on "The Metabolism of Alcohol" by Dr. Thorne Carpenter of the Carnegie Institution of Washington, at Boston, was read by title. The need for clarification of many points regarding the metabolism of alcoholism was pointed out and the previous work which had been done was shown in relation to the aspects of the subjects which remain problematical.

The clinical aspects of alcoholism were the subject of the afternoon session on December 27. Dr. Philip Piker of Cincinnati, Ohio, read a paper entitled "The Symptoms of Alcoholism," in which he described the appearance and behavior of persons under the influence of varying amounts of alcohol. The attempted correlations between alcoholic symptoms and blood alcohol levels should be regarded with skepticism in the light of Dr. Piker's findings with rabbits and human subjects.

Dr. H. Houston Merritt of the Harvard Medical School spoke on "The Examination of the Alcoholic Patient." The many conditions which may be present coincidentally with alcoholic intoxication and which serve to complicate the clinical picture were described. These include skull fracture, diabetic or uremic coma, various abnormal mental states, and intoxications caused by other toxic agents. Dr. Merritt emphasized the importance of correct diagnosis in order that appropriate treatment may be instituted without delay. Particularly Dr. Merritt stated that examination of the cerebrospinal fluid can be useful in the diagnosis of alcoholism.

"Chemical Tests in the Diagnosis of Acute Alcoholic Intoxication" was the contribution of Dr. Walter Jetter of the Taunton State Hospital and the department of legal medicine of the Harvard Medical School. This paper comprised a critical survey of methods for the objective determination of alcohol in body fluids and tissues and described a new method devised by the author in which a sample of expired air forms the material for analysis. The results of psychological tests which had been correlated with chemical findings were also presented.

The effect of chronic and acute alcoholism upon the organs and tissues of the body, except for the liver, is not specific for alcohol. Changes that do occur are low grade, such as chronic irritation and mildly inflammatory processes possibly resulting in atrophy of the gastric mucosa and edema of the brain and irritation of the meninges, together with possible alterations in the kidneys. Cirrhosis of the liver is the only condition in which alcohol appears to play more than a minor part. These facts, pointed out by Dr. Arthur W. Wright of Albany Medical College, Albany, New York, suggest that the effect of alcohol, like that of other substances, is mainly physiological and chemical rather than structural.

A new terminology was suggested by Dr. Norman Jolliffe of Bellevue Hospital, New York, for the diseases which have previously been considered to be exclusively the result of alcoholism, but which have now been proven to be the effect of vitamin-deficient diets. Dr. Jolliffe suggested the term *deficiency polyneuritis* instead of alcoholic polyneuritis, *nicotinic acid deficiency encephalopathy* instead of "wet brain" and *pellagra* instead of "alcoholic" or "pseudo" pellagra. He also pointed out that all deficiency diseases known to occur in man also occur in the alcoholic, such as scurvy, ariboflavinosis and vitamin A deficiency.

"The Causes of Death in Alcoholism" was the title of a paper by Dr. Timothy Leary, medical examiner of Boston. Dr. Leary reviewed a series of 1,000 alcoholic deaths from his long and extensive experience and pointed out that the alcoholic patient frequently dies from causes unrelated to alcohol itself. These include trauma, strangulation from unmasticated food or vomitus, rupture of the cardia or hemorrhage resulting from vomiting, frost-bite gangrene, pneumonia and other conditions related to exposure and avitaminoses, particularly those with central nervous system manifestations. Only one third of the cases reported died of acute alcoholic intoxication. That alcoholism is a disease and as such can be prevented more readily than it can be cured was stressed in this paper and in the following one by Professor Anton J. Carlson of the University of Chicago, department of physiology.

Dr. Carlson spoke on "The Alcohol Problem: Possible Lines of Useful Research." He pointed out that a great deal of knowledge is available regarding chronic alcoholism and temporary inebriety, and that the use of any amount of alcohol which will impair the personal, economic and social efficiency of an individual stands condemned. The importance of alcoholism as a contributory factor in producing crime, highway accidents and in its effect on longevity and upon the germ plasm appears to be a more promising phase of research than extensions of previous studies on the effect of alcohol on the individual. The "central" unknown in the problem remains the question, why alcohol in a given amount will cause one individual to become seriously intoxicated while another is unaffected.

The morning session, December 28, was devoted to the neuropsychiatric features of alcoholism, and was opened by Dr. Foster

Kennedy of Cornell Medical School with a paper on the neurological features encountered in chronic alcoholism. Dr. Kennedy reviewed the better known syndromes and spoke with emphasis about alcoholic polyneuritis and cerebral conditions complicated by alcoholism. The clinical results of alcoholism in families was also discussed. Dr. Kennedy expressed the opinion that alcoholic indulgence was a factor that precipitated seizures in epileptic personalities and aggravated existing epilepsy. He made interesting references to the epidemic neuritis of 1903 at Manchester, England, and to "Saturday night babies."

Dr. Leo Alexander of the Harvard Medical School presented a paper on "Neuropathological Findings in the Brain and Spinal Cord of Chronic Alcoholic Patients," illustrating it with photographs of brain and cord specimens. Dr. Alexander stated:

Almost all brains from chronic alcoholic patients show shrinkage (atrophy or pseudo-atrophy), most markedly of the frontal lobes, with corresponding increase of fluid in the subarachnoid space incorrectly referred to as edema. This gross shrinkage of the brain may be due to loss of brain substance from degeneration, to dehydration, or to a combination of both factors.

A frequent finding in chronic alcoholic patients is subdural hemorrhage, possibly due to vitamin C deficiency with major or minor trauma as a contributing factor.

The lesions of Wernicke's disease can be recognized grossly in chronic alcoholic brains, but are not always present, especially in early cases.

The microscopic findings may be divided into those in which the neural parenchyma is damaged directly (*neuronitis*) and a second group in which the neural parenchyma is affected only indirectly by damage to the vascular system (*Wernicke's Disease*).

Wernicke's disease may be regarded as due to extreme depletion of vitamin B₁, which can be furthered by an over-abundant supply of other vitamins, particularly of vitamins A and D.

The cerebellar degeneration of chronic alcoholic patients appears pathologically to stand somewhat in between the neuronitis and the Wernicke's disease groups.

The majority of pathological conditions in the nervous system of chronic alcoholic patients are therefore attributable to associated vitamin deficiencies due to decreased intake by the alcoholic patient's choice or habit, decreased utilization by the diseased gastrointestinal tract, increased requirement by the increased caloric burden of metabolism, and possibly by a still unascertained specific destructive chemical effect of alcohol and fusel oils upon ingested vitamins.

"The Effect of Alcohol on the Functions of the Nervous System" was described by Dr. Ross A. McFarland of the Fatigue

Laboratory of Harvard University. The psychological findings on the mechanism of the action of alcohol bear out the physiological theories, showing that the main effect is cortical with an adventitious peripheral effect. Dr. McFarland pointed out that the most urgent need in psychological experimentation is the exploration of the individual tolerance to alcohol in contrast to the acquired tolerance which is termed habituation. Such a project can be carried out to the best advantage in a cooperation between physiologist and psychologist.

Dr. David Wechsler of Bellevue Hospital, New York, presented material on "The Effect of Alcohol on Mental Activity." Dr. Wechsler stated:

In appraising the effect of alcohol on mental activity, it is necessary to distinguish between transitory changes observed in acute alcoholic intoxication and the reputed permanent changes following chronic alcoholism. Observations regarding mental changes in the two conditions, while mutually supportive, are not interchangeable.

Controlled studies on the mental effects of chronic alcoholism, though occasionally based on larger numbers, have usually been made under such variable conditions as to furnish data hardly more valid than those obtained through clinical observation. These studies confirm the loss in mental efficiency observed under experimental conditions and, in general, indicate a progressive, though uneven, deterioration in the global functioning ability and personality structure of the chronic alcoholic. Outstanding is the impairment of the subjects' ability to integrate, particularly at the higher functioning levels.

Dr. Wechsler's paper summarized these tendencies as revealed in published data and as shown in his study of 40 cases of chronic alcoholism admitted at Bellevue Psychiatric Hospital during the period 1938-1940, and especially analyzed in preparation for his paper. The value of the quantitative methods of clinical psychology was demonstrated and the possibilities of further study by these methods was discussed.

"Alcoholism and Mental Disease" was the subject of a paper by Dr. Nolan D. C. Lewis of the Psychiatric Institute of New York, who differentiated between the various mental disorders due to, or acutely released by, over-indulgence in and special sensitivity to alcohol. The personality factors and characteristic reactions in conditions known as pathological intoxication, delirium tremens, acute hallucinosis, paranoid developments, alcoholic

"deterioration," and other disorders were considered. Some of these disturbances, Dr. Lewis stated, were, in his opinion an expression of other psychoses. The rôle of alcohol in certain neurogenic conditions was discussed and their relationship to other determining elements was brought into relief.

A paper by the late Dr. Paul Schilder on the "Psychogenesis of Alcoholism" was read by Dr. Merrill Moore. According to Schilder:

The chief effect of alcohol on psychological function is that of reduced efficiency. There is a strong tendency toward impoverishment of associations and an egocentric form of behavior. The basic pattern of drinking varies with the situation of the individual and may be accompanied by an associated breakdown of sexual and aggressive impulses. Early childhood experiences may have required a variation in the pattern of sexuality which may appear during intoxication and may be characterized by violence. The chronic alcoholic has lived from earliest childhood in a state of insecurity and alcohol appears to reverse this situation; at least during the period of its influence. The attitudes of parents towards children which will promote security and a normal amount of aggression and which will guarantee a reasonably free development of sexual adaptation will be powerful factors in the prevention of alcoholism.

Dr. Alexandra Adler of the Harvard Medical School, speaking on "The Individual Psychology of the Alcoholic Patient," said:

Alcoholism, as well as many other neuroses, represents an escape from challenge and possible defeat. Alcoholic patients are usually unwilling or unable to assume responsibility, considering themselves victims of a mysterious addiction which they feel precludes the assumption of responsibility by them. The difference in the psychology of the chronic alcoholic and the dipsomaniac or periodic drinker appears to be quantitative.

Dr. E. M. Jellinek, speaking on "Heredity, Constitution and Alcoholism," reviewed some frequently quoted statistics on alcoholism, especially those offered as evidence of hereditary factors in relation to alcohol. He touched briefly on the work he had in progress and summarized some current opinions concerning hereditary aspects of alcoholism.

Mr. Lowell Trowbridge of Boston gave a paper on "Alcohol Absorption and Behavior in Chronic Alcoholic Patients." This study was made in a state hospital on a group of male patients diagnosed as chronic alcoholics. A comparison between blood alcohol concentration and behavior of the entire group showed

some correlation, but this was not apparent when individual members of the group were studied.

Dr. William G. Lennox of the Harvard Medical School was the author of a paper, read by title, on "The Influence of Alcohol on Convulsions in Epilepsy." Dr. Lennox reported a statistical study of the records of 1,254 patients with epilepsy who were fifteen years or more old. Of these, 26 per cent used alcohol moderately and 6 per cent used it to excess, figures which are not greater than those for a control group. Alcohol was used less by females than by males and to the same extent by essential and symptomatic patients. The number in whom alcohol was observed to be a factor in producing seizures was 6 per cent of all patients and 21 per cent of those who used alcohol and the proportion was greater among males than females. In the group of frequent users, 57 per cent reported that seizures sometimes or frequently followed indulgence. Dr. Lennox concluded:

The physiological or chemical mechanism by which this narcotic drug produces seizures in predisposed persons in the "sobering up" period is not clear. The need for an electroencephalographic survey of alcoholics and their relatives is particularly urgent.

In the afternoon session the treatment and prevention of alcoholism were discussed. Dr. Wilfred Bloomberg of the Boston City Hospital discussed the medical treatment of alcoholism with special reference to the use of benzedrine sulfate, emphasizing the toxic action of alcohol itself. The elimination of alcohol and dehydration were considered together with sedation of various types. Dr. Bloomberg presented a statistical report of results in 60 cases in which benzedrine sulfate was used as an aid to the treatment of the chronic phases of alcoholism.

"Treatment of the Alcoholic Addict" was the subject of a paper by Dr. Robert V. Seliger of the Johns Hopkins Hospital, who presented a discussion of hospital, farm and extra-mural treatment and the selection of the type of treatment, partly on the basis of the patient and his condition and partly on the basis of his life situations at the time. The importance of careful investigation of all medical, psychological, psychiatric, social and behavior aspects and of all available facts of the case was emphasized by Dr. Seliger. The methods and procedures followed in each type of treatment were described in detail.

Dr. Karl M. Bowman, professor of psychiatry at the New York University College of Medicine and director of the Division of Psychiatry, Bellevue Hospital, reviewed the literature on the treatment of delirium tremens and evaluated the opinions of different authorities. Dr. Bowman suggested a method for treatment which is based on the limitation of restraint to a minimum, the use of paraldehyde as the sedative of choice, the combating of dehydration and acidosis by forcing fluids and giving malt, the use of a high caloric diet plus insulin, and the use of vitamins—particularly the B complex.

Dr. Charles E. Parsons of the Washingtonian Hospital, Boston, said in discussing "The Problems and Methods in a Hospital for Alcoholics":

There were 19.5 convictions for drunkenness per 10,000 population in Boston for the year 1938-39 as compared with 11.31 for the same period for England, Scotland and Wales. Fifty-two per cent of the deaths from poisoning for the 10-year period of 1928-1937 for Massachusetts were due to alcohol. The Washingtonian Hospital in Boston tries to do its share in meeting these problems. It cared for 454 cases between March 1 and December 1, 1940, and the mortality rate for all cases was 0.65 per cent.

The private psychiatric hospital was viewed by Dr. Harry M. Tiebout, physician-in-charge, Blythewood, Greenwich, Connecticut, as an important way station on the road to health. Beyond its opportunity for rehabilitating the body of the individual alcoholic, it has a specific job, namely, starting the patient to think and figure straight about his problem.

Dr. Bernard Glueck of Stony Lodge Foundation, Ossining, New York, criticized the present-day methods of treating alcoholism. However, as Dr. Glueck pointed out, the causes of failure are manageable for the most part and are not due to the inherent psycho-dynamics of the drinker.

Dr. Charles H. Durfee of Rocky Meadows Farm, Wakefield, Rhode Island, read a paper by title which undertook to correct some popular misconceptions, held by physicians and laymen alike, with regard to alcoholics and alcoholism. Dr. Durfee held that there is no alcoholic "type" but only individuals who drink for various reasons, many of whom are in need of psychiatric care. A genuine cure does not mean mere abstinence over shorter or

longer periods, but results in or follows a radical personality readjustment which does away with the need for alcohol.

At the Sunday morning session on the social and legal problems of alcoholism, Dr. Lawrence Kolb of the United States Public Health Service stated in a paper on "Alcoholism and Public Health":

Alcoholism is a serious health problem that has been handled largely by police authorities, with the result that the alcoholic has been treated as a criminal rather than as a sick individual. Present-day methods of handling chronic alcoholics are ineffective or harmful. An intensive study of the prevalence and causes of alcoholism and effects of alcohol are necessary in order to establish a sound basis for better methods of prevention and cure.

"Some Statistical Facts about Alcoholism in Massachusetts" by Dr. Neil C. Dayton of the Massachusetts Department of Mental Health, revealed that the records of one-fifth of all admissions to mental hospitals in Massachusetts between 1917 and 1933 indicate that chronic alcoholism was a prominent etiological factor. Of 56,579 first admissions in this period, 32 per cent of the male patients were classified as intemperate in the use of alcohol and 33 per cent in addition were found to have used alcohol to some extent. The female patients among the first admissions, who used alcohol, were much fewer. Chronic alcoholism was highest among these patients in 1917 and lowest in 1920. The latter year was also the lowest in total admissions to mental hospitals. Both sexes show the highest percentage of chronic alcoholism between the ages of 30 and 60 years. The incidence of alcoholism among mental patients bears an inverse ratio to the educational level and the economic status, generally. Unmarried patients show a lower incidence of alcoholism than do married, widowed or divorced persons in the group studied.

The major problems concern the meaning of "drunkenness" and "under the influence of liquor"; the methods of proving these states to exist, and the differentiation of drunkenness in relation to various other circumstances of public importance as well as the improvement of sentencing procedures and the establishment of standards based on sociological and psychiatric knowledge, comprised the subject matter of an address by Dr. Jerome Hall, professor of law, Indiana University Law School. Dr. Hall stressed the need for uniform legislation.

Professor Edwin R. Keedy of the University of Pennsylvania Law School spoke of the legal responsibility of the alcoholic, and described the many situations in which this becomes a vital question. The relation of alcoholism to highway safety and to crimes of violence are among the most common legal implications of alcoholism.

Mr. Morris Ploscowe, clerk of the Court of Special Sessions, drew upon his long experience with alcoholics to describe the method by which New York City handles the many persons who are arrested for drunkenness. Mr. Ploscowe admitted the inadequacy of the handling of these prisoners and made a number of recommendations about their future treatment by the courts.

"The Penal and Correctional Aspects of the Alcoholic Problem" by Austin H. MacCormick, executive director of The Osborne Association, was a paper which pointed out the need for the establishment of colonies of the farm, forest or work-camp type for inebriates. Mr. MacCormick stated that the frequent failure of the splendid facilities for the treatment of alcoholism at Riker's Island in New York is due to the poor physical condition of the persons sent there and the short sentences imposed in an effort to reduce the prison population of the city. Substantial progress has been made in state and federal prisons and an enlightened viewpoint prevails in many of them where progressive officials talk of care and treatment instead of custody and punishment.

The final session for the presentation of original papers was held on Sunday afternoon, December 29, when the discussion of the social and legal problems of alcoholism was concluded. Dr. Horatio M. Pollock of the New York Department of Mental Hygiene discussed the social costs of alcoholism, reviewing available facts concerning the present-day use of alcoholic beverages in the United States, and discussing the effect of such use on economic status, employment, crime, physical illness and mental disease. Some suggestions were offered relating to ways and means of lessening the unfavorable effects of alcohol.

Mrs. Harriet R. Mowrer of Evanston, Illinois, spoke on "Alcoholism and the Family." Mrs. Mowrer stated:

Alcoholism is one of the many problems of personality adjustment which have their genesis in the complex of familial relationships out of which the

patterns of personality are developed. The ordinal position in the family constellation seems to have some importance for most chronic alcoholics appear near the oldest and youngest of the sibling group. The cultural background and economic adjustment are important in measuring the individual response to family organization. . . . Marital discord is not the result of alcoholism but of the same etiological factors. The alcoholic tends to enter marriage handicapped by economic insecurity, dissatisfaction with occupational choice and a tendency to resort to substitute adjustment devices.

"Alcohol as a Factor in Traffic Accidents" was discussed by Dr. Donald S. Berry, secretary, Committee on Tests for Intoxication of the National Safety Council. He stated that about one-third of all fatal traffic accidents involve a driver or a pedestrian under the influence of alcohol. The police have trouble in convicting obviously guilty drivers because the observed conditions may be claimed to have been due to illness, injury or medication. Chemical tests eliminate guess-work and have been used successfully in at least 27 states. Dr. Berry recommended that they be more widely adopted.

Dr. Jeremiah P. Shalloo of the University of Pennsylvania, speaking of the cultural factors involved in alcoholism, said:

It is culturally imperative to toast the bride, christen the ship, seal the bargain, speed the friend, salute the New Year, celebrate good fortune, wake the dead and even symbolize and ingest the blood of the Savior through the medium of alcohol. . . . With so many various forms of culturally approved drinking, the amazing result is that we have so few persons emotionally dependent upon alcohol in some form. The teetotaler is, after all, equally as abnormal from the cultural standpoint as is the habitual drinker. . . . Social habits which develop in response to cultural sanctions cannot be eliminated by sumptuary legislation.

Dr. Shalloo declared that the failure of prohibition was eloquent testimony of the essentially alcoholic nature of contemporary American culture.

Dr. George S. Stevenson of the National Committee for Mental Hygiene gave the closing paper at this session. His subject was "Education and the Control of Alcoholism." Dr. Stevenson stressed the need of mental hygiene in colleges and educational institutions, "where alcoholism often begins." He spoke of the advantages that could result from the dissemination and application of information such as a fact-finding organization might develop.

The Surgeon-General of the United States Public Health Service presided at the final meeting, which was open to the public. He discussed the attitude of the federal government to major health problems and observed that it was not inconceivable that alcoholism might soon take its place beside those other disease conditions once thought uncontrollable, which are now better understood. He mentioned tuberculosis, syphilis and cancer. Dr. Parran introduced Dr. Abraham Myerson of Boston, who made the principal address. Dr. Myerson's subject was "The Social Pharmacology of Alcoholism." He stated that there is some danger of over-emphasis in two directions in the present-day consideration of alcoholism. In the first place, the rôle of the vitamins should not obscure the fact that alcohol is in itself a narcotic drug and very likely has chronic effects which are independent of the rôle of the vitamins or, at any rate, if not independent, of primary intrinsic importance. This also brings to light the fact that certain drugs do have a useful rôle in the treatment of acute and chronic alcoholism, especially amphetamine sulfate, metrazol and the combination of insulin and glucose.

The second over-emphasis may be on the neurosis of the individual alcoholic. It is perfectly true that the individual who becomes a chronic alcoholic does so in relationship to social and emotional difficulty. Yet there are groups in the population who do not become alcoholics, who have plenty of social and emotional difficulty and who have a high incidence of other neuroses and psychoses. Dr. Myerson concluded:

It must be taken into account that the social attitude towards the drinking of alcohol is one of the most important things in our civilization. Thus, alcohol is the drug used to enhance good fellowship and to evince gaiety and celebration as well as ceremony. In other words, to class it simply as a drug of escape or for the purpose of bringing about oblivion is only expressing one phase of its psychological use. The other phase—celebration and ceremony—is of great value for us to understand. Moreover, the measure of personality worth has, to a certain extent and in large segments of the population, become the ability to handle alcohol,—in other words, to be able to drink large quantities. The whole attitude of society toward the use of alcohol and toward the alcoholic has become decidedly ambivalent. This total social pressure must be met by social means and social re-education as well as by social legislation, as perhaps the most important part of the prevention of alcoholism.

Comment.

THE HEALTH OF TEACHERS.

Mental hygienists have long since recognized the importance of social relationships in promoting mental health or ill-health. During childhood and youth these factors take on added significance. Their weight of influence becomes greater still when these relationships involve authority and control. No demonstration should be needed that the welfare and wholesome mental development of the growing individual are favored by having healthy-minded parents and healthy-minded teachers, or that such welfare and development may be seriously prejudiced if these conditions are not fulfilled.

The nature of the teacher-pupil relationship is of particular consequence for obvious reasons. Examples are not unknown of behavior problems attributable wholly or in part to unfavorable attitudes or methods of teachers, which may themselves be the expression of poor mental stability, emotional imbalance, unwholesome prejudices and the like.

Surely there is no position of trust and responsibility in which it is more necessary that the medical examination of a candidate should be in fact a *complete* examination, that it should give evidence not only of physical soundness but also of personality fitness and mental health; and further that such examinations should be repeated whenever indicated.

For some time this whole question has been under consideration by the board of education of New York City. The issue became acute a year or two ago when a teacher in one of the city schools refused to submit to a medical examination deemed advisable by the board and was upheld in her refusal by the State Commissioner of Education. Thereupon the board of education sought legislative redress and this spring a law was passed at Albany making compulsory the medical examination of a school teacher whenever in the opinion of her principal this is considered necessary.

The rights of the individual teacher are amply protected by the regulations and retirement cannot be enforced until the case has been reviewed by the board of superintendents, the board of education and the medical board of the retirement system.

Thus for the first time a systematic check on the health of teachers in the New York City schools is possible. Not alone physical disability but quite as much personality problems or suspected mental unfitness will constitute grounds for requiring a teacher to appear before the medical staff of the board of education in order that her suitability to carry on with her duties may be determined. With the safeguards that have been provided it is hardly likely that the new authority will be abused, and it is calculated to strengthen the community mental hygiene program in an area where its importance is great, namely that of providing and maintaining wholesome instructional and disciplinary influences in the schools.

News and Notes

DEATH OF DR. T. A. ROSS.—Medicine and psychiatry have suffered loss in the recent death of Thomas Arthur Ross, M. D., F. R. C. P., of London. Dr. Ross is probably best known through his valuable and widely used book *The Common Neuroses* which was published in 1923 and appeared in a second edition in 1937. This book was written for the profession at large and expressed its author's conviction that the common functional nervous troubles should be treated by the general practitioner and need not as a rule be referred to so-called psychotherapeutic specialists. It is as wholesome a book on psychotherapy as has appeared. Of it Sir Arthur Hurst says:

I have always told students that whatever textbook on medicine they like to read they must supplement it by reading Ross' *Common Neuroses* if they aspire to be successful practitioners.

Dr. Ross, a native of Edinburgh, was born in 1875. He was a student of Weir Mitchell, Déjerine and Head, and during the Great War his services were required for the treatment of war neuroses. When through the munificence of Sir Ernest Cassel was established in 1919 the Cassel Hospital for Functional Nervous Disorders designed for patients of moderate means, the first of its kind in Great Britain, Ross was chosen as first director, serving in this capacity until 1934. The results of his work at the Cassel Hospital were summed up in a very useful book, *Enquiry into Prognosis in the Neuroses* (1936).

Dr. Ross paid a visit to various American hospitals before taking up his work at the Cassel and he had many friends on this side of the Atlantic. His contributions to psychiatric literature and practice are the common heritage of the English speaking peoples.

SECOND AMERICAN CONGRESS ON GENERAL SEMANTICS.—The University of Denver announces that the Second American Con-

gress on General Semantics will be held at the University of Denver August 1 and 2, 1941. The Congress is being organized by Professor Elwood Murray of the University of Denver and Miss M. Kendig, educational director of the Institute of General Semantics, Chicago. *New methodological foundations* for cultural integration will be stressed in the addresses of Alfred Korzybski and other principal speakers. Several sessions will be devoted to papers on empirical applications of general semantics methods in general and specialized education, medicine, psychiatry, clinical psychology, linguistics, economics, law, etc., and on related empirical data from many fields of scientific investigation. The Congress Proceedings will be published early in 1942. Those wishing to present papers should submit duplicate copies of abstracts to M. Kendig, Institute of General Semantics, 1234 East 56th Street, Chicago, Ill. All other correspondence should be addressed to Professor Murray, general chairman of the Congress, University of Denver, Denver, Colorado.

ESTABLISHMENT OF MENTAL HYGIENE DIVISION OF ALABAMA STATE DEPARTMENT OF HEALTH.—Dr. Archibald M. Gaulocher, a graduate of Columbia University and of the College of Physicians and Surgeons, has been added to the staff of the State Department of Health of Alabama as associate in charge of its Division of Mental Hygiene, according to announcement by Dr. J. N. Baker, State Health Officer.

Dr. Gaulocher had served ten years on the staff of the Central Islip State Hospital, in New York City, at the time of his resignation to become associated with the Alabama State Department of Health, and had also had considerable experience and training in other centres to equip him for his new post.

In announcing the new division in the State Health Department, Dr. Baker said that it would be his purpose to cooperate with county medical societies and other groups in the operation of mental hygiene programs in various parts of the State. The division of mental hygiene will be a unit of the Bureau of Hygiene and Nursing.

PENNSYLVANIA PSYCHIATRIC SOCIETY.—The second regular mid-year meeting of the Pennsylvania Psychiatric Society was held at the Allentown State Hospital, Allentown, Pa., Thursday, April 10, 1941. Members of the Society were guests of the Allentown State Hospital and of Henry I. Klopp, M. D., superintendent, during the day and at buffet supper.

The president, Dr. Klopp, presided and Dr. LeRoy M. A. Maeder served in his office of secretary-treasurer.

Following an address by President Klopp, the scientific presentations were as follows:

"Results of Fever Therapy," by Harry F. Hoffman, M. D., asst. supt. and clinical director, Allentown State Hospital.

Discussion by Ethel Friedman Buchman, M. D., pathologist, Allentown State Hospital, Joseph Hughes, M. D., director of laboratories, Institute of the Pennsylvania Hospital, Philadelphia, Joseph C. Yaskin, M. D., professor of neurology, Graduate School of Medicine, University of Pennsylvania, Philadelphia.

"Childhood Psychoses: Therapeutic Problem," by Max Rossman, M. D., senior asst. physician in charge of Institute for Boys and Girls, Allentown State Hospital.

Discussion by Joseph A. Cammarata, M. D., asst. supt., Danville State Hospital, Paul Holmer, M. D., director, Guidance Institute of Berks County, Reading, Robert H. Israel, M. D., superintendent, Warren State Hospital, Gerald H. J. Pearson, M. D., Institute of the Pennsylvania Hospital, Philadelphia.

MENTAL HYGIENE DIVISION, SUFFOLK (N. Y.) COUNTY DEPARTMENT OF HEALTH.—Dr. A. T. Davis, commissioner of health, County of Suffolk, announces the appointment of Dr. George M. Lott, formerly of the bureau of child guidance of the board of education, New York City, as director of the newly established mental hygiene division of the county department of health.

This service is believed to be the first of its kind set up in a county health department. Dr. Edward S. Godfrey, commissioner of health for the State of New York, considers the care and prevention of mental illness to be a proper function of health departments and state aid has been granted for this service in the same manner as other services which have long been recognized as routine functions of health departments.

Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, wrote to the Suffolk County department of health as follows:

Please accept my heartiest commendation for this forward step in not only recognizing that to a large degree mental health is purchasable, but also because you have identified mental health as a public health problem and accept responsibility for such work in your organized health department. You are expressing an attitude which reflects mine in this matter and one which the Public Health Service intends to encourage among organized health agencies as vigorously as possible.

EMERGENCY REGISTER OF PHYSICIANS WITH PSYCHIATRIC EXPERIENCE.—The National Committee for Mental Hygiene wishes to enlarge its roster of physicians who have had some psychiatric service and might be available during the emergency to help keep up the work of some mental hospital. Some may be doing things which they consider not especially important; some may have retired. Obviously a person whose physical health makes him incapable of good service would not be available, but age of itself will not be considered very detrimental when medical staffs are short.

It is requested that all those who see this notice inform the National Committee (1790 Broadway, New York City) of the name and address of any such physician. Many such men have not been actively engaged in psychiatry of late and hence are not members of psychiatric organizations, but their mental hospital experience in former years may have been of very good standard.

CIVILIAN MENTAL HEALTH IN WAR TIME.—The Military Mobilization Committee of The American Psychiatric Association has assembled through its subcommittee dealing with civilian mental health a considerable amount of information concerning behavior reactions which have appeared in other countries, particularly those which are actively belligerent. This information together with data concerning the measures which have been taken to deal with these reactions has been compiled in reports which

are available to the members of the Association. These reports can be obtained on application to Dr. D. Ewen Cameron, Albany Hospital, Albany, New York.

BUREAU OF CHILD GUIDANCE, BOARD OF EDUCATION, NEW YORK CITY.—The decennial celebration of the Bureau of Child Guidance, Board of Education, New York City has been set for October 18, 1941, at the Waldorf Astoria Hotel. There will be a morning of panel discussions followed by a luncheon.

The panel on the general field of guidance will be led by Dr. Frank J. O'Brien, former director of the Bureau and recently appointed associate superintendent of schools. Dr. Eugene C. Ciccarelli, psychiatrist, together with Dr. Morris Krugman, chief psychologist, and other leaders, will conduct a symposium on learning difficulties. Miss Shirley Leonard, chief psychiatric social worker, will lead a panel on the adolescent; Dr. Emanuel Klein on the problem child; Mr. Samuel Goldberg on the exceptional child; Dr. Max Winsor on the young delinquent.

Book Reviews.

CHILD PSYCHOLOGY FOR PROFESSIONAL WORKERS. By Florence M. Teagarden, Ph. D. (New York: Prentice-Hall Inc., 1940.)

This book was prepared for a three-fold purpose: (1) to attempt to inform professional workers about normal children; (2) to aid in training them in understanding abnormal children; and (3) to prepare a more adequate textbook on child psychology.

The subject which naturally spreads over a large field is presented in seventeen chapters, with the origin and early development of the child coming first for consideration. Some of the mechanisms and current concepts of heredity are discussed, of which very few can be applied directly to human problems until more work has been done on identical twins, a type of investigation which is now popular and productive in several centers in America. The possible effects of x-rays, radium, lead poisoning, alcohol and various diseases on the germ plasm are presented, but the author wisely avoids making final pronouncements on several of these factors.

Several superstitions about pregnancy, what is known about prenatal development of the child in utero, birth accidents and a liberal description of the practical aspects of the "new baby" situation are outlined, and followed by chapters dealing with the newly born infant, its sensory and motor development, its emotions and its sleep. Here many of the comments are not particularly enlightening as the important findings of the freudian school are largely neglected, and apparently they have not been displaced by other research results.

The book covers a great deal of ground on the pre-school child, on the nature of habits such as eating, toilet, dressing, sleep and many of their pathological deviations, on the child and its home relationships with parents and siblings, on punishment and culture conflicts, on broken home, foster home and institutional situations, and on the need for special studies and evaluations of homes into which children are to be adopted. There is a chapter on the mechanisms of the emotions and their rôle in producing conduct disorders; another one on the sex life of the child, including parental attitudes, sex education and a number of distortions of the sex impulse; and one on intelligence. The last five chapters are devoted to the child's adjustment in school, behavior difficulties, diseases and those handicaps imposed by visual, auditory, speech and other deficiencies and disorders. The book ends with "The Children's Charter" from the White House Conference, 1930.

Almost every aspect of the realm of normal and abnormal psychology of childhood has been included in this one volume which has necessitated a

brief and inadequate presentation of many of the special subjects; however, it should serve its purpose as an orientation or as a review and aid for those who need this instruction. An extensive, selected, pertinent literature is cited and listed, which should be of great value to the student who wishes to gain a knowledge of the background and details of this division of psychology. There is a serviceable index.

NOLAN D. C. LEWIS, M. D.,

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JUVENILE DELINQUENTS GROWN UP. By *Sheldon and Eleanor Glueck*.
(New York: The Commonwealth Fund, 1940.)

Once again the Gluecks have put in their debt those of us who are interested in the "natural history" of crime. By a careful and most amazingly successful individual follow-up of large numbers of offenders, they have provided a mass of data never before available; from such data sound conclusions may be drawn with regard to the success (or otherwise) of "correctional" treatment, and likewise as to the factors which make for the failure or success of such treatment.

The present volume is a sequel to *One Thousand Delinquents*, published in 1934. In that work the authors traced for a five-year period immediately following treatment the careers of 1000 boys who appeared before the Juvenile Court of Boston. This volume follows the same boys through two subsequent five-year periods. The boys, who in the 1917-22 period were of an average age of 13½ years, are now "grown up," with an average age of about 29 years. Of the original thousand, 60 had died by the end of the third five-year period; information was secured concerning all but 42 of the survivors! One unusual feature of the group is that all of the original thousand had been examined by the Judge Baker Foundation, at the request of the late Frederick P. Cabot, the enlightened and distinguished Judge of the Juvenile Court, before disposition. Unfortunately, for reasons beyond the control of the court and the Foundation, many of the recommendations of the latter could not be followed; nevertheless, the fact remains that information is at hand concerning the mental condition of these delinquents at the time of their original appearance in court. "The examination by the psychiatrists at the clinic further revealed that 557 (56 per cent) of these boys had marked mental, emotional, or personality distortions, a diagnosis having been made in 137 instances of constitutionally inferior personality, psychopathy, 'peculiar personality,' epilepsy, traumatic constitution, psychosis or 'question of psychosis'; in 70 of the cases the diagnosis was 'marked adolescent instability'; while in 350 cases there were manifested, to a degree noted by the psychiatrists as excessive, various deviant personality traits, such as great impulsiveness, over-suggestibility, marked sensitiveness, and the like" (p. 13).

It is noted that with the passage of time the rate of non-delinquency increased (14.6 per cent at end of first 5-year period, 26.8 per cent at end

of second, 36.6 per cent at end of third), and that those offenses committed tended to become less serious. Incidentally, of those arrested (540 persons) during the third period, nearly one-fourth came to the attention of the courts primarily as drunkards. Further, as indicating that the prospects for the group as a whole were far from brilliant, it is stated (p. 87): "only 109 of the original group of 1000 were non-delinquents throughout the three follow-up spans, while 226 were serious offenders, and 88 were minor offenders throughout the fifteen years."

As an explanation of the gradual increasing of non-delinquency with the passage of time, the Gluecks develop their thesis of "maturation" as offered earlier in their volume *Later Criminal Careers*. They conclude that (p. 94) "not arrival at any particular age, but rather the achievement of adequate maturation regardless of the chronological age at which it occurs, is the significant factor in the behavior changes of criminals." Comparison of the juvenile court group with the reformatory group seems to indicate that the age at which "maturation" is reached bears a close relation to the age at which antisocial behavior has its onset; that is, the group which came before the court earlier in life tended likewise to mature earlier (p. 97). Further, reformation, as we might have guessed, is favored by more wholesome early surroundings and better biological endowment (p. 115).

Several chapters are devoted to a close study of the response of various groups to the several types of correctional treatment, and to a further development of the very significant work of the authors on predictive tables.

In the chapter entitled "Summary and Conclusions" we find a challenge to psychiatrists which is worthy to be taken up: (p. 270) "The next step in developing the theory of the relationship of maturation to delinquency and criminality is to dissect 'maturation' into its components. Such a task must be left to specialists in psychiatry, psychology, physiology, medicine and related disciplines. The aim should be to develop norms of maturity in every aspect of mental and physical growth at various age-levels—in emotional equipment, in inhibitory powers, in sexual development, etc. Deviation of individuals from such norms could then be readily determined and an 'M. Q.' (maturation quotient) could be established."

The volume is a valuable contribution to criminological literature, and can be heartily recommended.

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THE ETIOLOGY OF CHILD BEHAVIOR DIFFICULTIES, JUVENILE DELINQUENCY AND ADULT CRIMINALITY WITH SPECIAL REFERENCE TO THEIR OCCURRENCE IN TWINS. No. I, Psychiatric Monographs. By Aaron J. Rosanoff, M. D., Leva M. Handy, M. A., and Isabel Rosanoff Plesset, B. A. (Sacramento, Cal.: Department of Institutions, 1941.)

The main bulk of this monograph is occupied by case records of 409 pairs of twins with child behavior difficulties, juvenile delinquency or adult criminality shown by one or both of the twins in each pair.

For the purposes of this presentation the entire material has been classified into 80 groups of cases, such groups containing from 1 to 18 cases. These groups are distinguished according to type of twins, sex, type of behavior difficulty, concordance or discordance of findings, and presence or absence of subnormal intelligence or other complicating condition.

The findings revealed by this material bear out the conclusion, arrived at by previous twin studies, to the effect that hereditary factors play an important part in the etiology of delinquency and criminality.

Another factor of importance in the etiology of these conditions, as indicated by the material of this study, is that of cerebral birth trauma.

In many cases the etiologic mechanism seems to depend on the operation of two factors: a hereditary factor determining a special familial vulnerability of the brain tissues, and a birth trauma attributable partly to such vulnerability and occurring at times even under conditions of approximately normal labor.

It goes without saying that, under conditions of difficult labor, cerebral birth trauma, followed by sequels in the nature of delinquency or criminality, may occur in the absence of any hereditary factor.

In this monograph incidental criminality is distinguished from criminalism; the former being, for the most part, environmentally determined, while the latter is, in the main, constitutional and organic.

The main criterion for this differentiation is that of recidivism, which characterizes criminalism rather than incidental criminality. In this connection it is noted that official crime statistics, which reflect only a relatively small part of the facts, indicate that most crime is committed by a comparative handful of recidivists in the population.

The factor of sex is of overwhelming importance in the etiology of delinquency and criminality. From a quantitative standpoint the male sex is perhaps ten times as much involved as the female; and from a qualitative standpoint the delinquency and criminality of the two sexes hardly represent, for the most part, the same thing. In the psychology of the sexes no contrast is so great as that represented by the delinquency and criminality respectively observed in them.

AUTHORS' ABSTRACT.

A TEXTBOOK OF PSYCHIATRY. Third Edition. By *A. P. Noyes, M. D., and E. M. Haydon, A. B., R. N.* (New York: The Macmillan Company, 1940.)

In this third edition, the authors, a psychiatrist and a psychiatric nurse, have collaborated with significant effect to produce a psychiatric text for nurses. In this edition, also, a special discussion of shock therapy and a chapter on psychiatric and nursing history have been added, thus rounding out and bringing up-to-date an already very commendable presentation. The treatment throughout is simple, understandable and practical. At the same time, however, it is thoroughly scientific and, considering the modest proportions of the volume, 315 pages, gratifyingly complete. This, with its

excellent and convenient format, should do not a little to ensure the work a really significant place in the nursing field.

T. R.

PSYCHOLOGICAL AND NEUROLOGICAL DEFINITIONS AND THE UNCONSCIOUS.

By *Samuel Kahn, M. D., Ph. D.* (Boston: Meador Publishing Company, 1940.)

Dr. Kahn's little book is curiously composed: it contains an introduction, a preface and a foreword by three separate writers, a chapter on the "History and Background of Dr. Sigmund Freud and Psychoanalysis," another one on the "Philosophy of the Unconscious and Psychoanalysis," a third entitled "Subconscious Speculations," then a glossary of 591 terms, and finally a long bibliography.

Concerning Freud, Dr. Kahn presents what amounts to the familiar account given by Freud himself and often repeated in various introductions to Freud's works. It is a summary, and a very brief one, offering of course no new facts or opinions. The chapter called the "Philosophy of the Unconscious" is something of a misnomer; it expounds the fact, rather, that certain philosophers (Kant, Feuchtersleben) were interested in psychotherapy, that others (Leibnitz, Hartmann, Nietzsche) either used the word or had aphoristic premonitions of Freudian theory, and finally that Charcot and other neurologists (neurological Sauls among the philosophical prophets) contributed to the conception by their work with hysteria and hypnosis. The chapter heading "Subconscious Speculations" is equally a misnomer, for it contains speculations on the unconscious or on unconscious mentation, as given by Muensterberg, Morton Prince, Sidis and others. Of these chapters in general it may be said that their content is well known certainly to most psychiatrists and psychologists, as it is readily available. The exposition is not in itself original. Seriously to be criticized in a book where accuracy is the chief excuse for its being are such mistakes: Munsterberg on three pages, and Chrodak (for Chrobak); further, Maine de Biran in one place is called *Miane* de Biran, in another *M. de Diran*; Schrenck-Notzing's hyphenated name is separated by a comma and misspelled *Shrenick, Notzing*.

The 591 terms of the glossary are from the fields of psychiatry, psychoanalysis, psychology and neurology, and are on the whole the terms most commonly met with in the literature in those fields. A brief explanatory account is given of each term, often a simple definition. It is the presence of so many non-psychoanalytic terms in this glossary, following the predominantly psychoanalytic interest of the first chapters, that accounts for the disunited effect of the book. The reliability of the definitions varies. The academic psychological ones and the neurological ones come off best; the psychoanalytical ones are the least successful. Chiefly this lack of success is through excessive brevity, for it is evident that many terms cannot be elucidated as such but would require an extensive exposition; but even so, certain explanations (e.g., "Latency Period: The period of

psychosexual development, covering the years of six to fourteen, which approximated the Oedipus repression epoch to pubescence") are unclear, while others are misleading (e.g., "Reflexes: These are certain responses to stimuli which do not involve the brain.") The lexicographer's task is uninviting, the lexicographer is uninvited.

The 59 page bibliography reflects an extensive rather than a selective reading of the literature.

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PSYCHOLOGICAL STUDIES IN DEMENTIA PRÆCOX. By Isabelle Kendig, Ph. D., and Winifred V. Richmond, Ph. D. (Ann Arbor, Mich.; Edwards Bros. Inc., 1940.)

The three closely related studies reported in this monograph are based on an analysis of the records of test performance (Stanford Binet, old form) obtained over a period of fifteen years (1921-1936) by the psychological department of St. Elizabeths Hospital in Washington. It may be said at once that no one actively engaged or even seriously interested in the psychological investigation of mental disease can afford to overlook this important contribution.

Since the validity of mental tests applied to psychotic persons is sometimes questioned, it is important to recognize that the performance of any subject on a test is essentially never anything more than an indication of that subject's mental efficiency at the time of the test. Under ordinary conditions and with "normal" subjects, it has been found that certain measures of present mental efficiency happen to be fairly reliable indices both of original mental endowment and of future intellectual status. This is, of course, not true in the case of a subject who, at the time of the test, is mentally ill. Yet the test remains a useful and valid measure of that subject's present level of mental functioning. It is unfortunate that confusion on this question may have served to discourage the regular use of standardized test procedures in the psychological study of the mentally ill. On this issue, the present monograph is quite explicit: "Our experience leads us to state unequivocally that, if a psychotic person is at all accessible, it is perfectly feasible to apply tests, and learn therefrom all that can be learned in any case, and that is, the level of mental function at the time and under the circumstances of the examination." (p. 5).

The regular use of a standardized test procedure under relatively constant conditions and over a long period of time has provided the authors with a much larger body of psychometric data on mental hospital patients than is usually available. (Cases include 500 dementia præcox, 573 with other psychotic conditions, and 346 adult non-psychotic "control" subjects.) In the handling of this data, a high degree of statistical competence has been displayed. Yet the importance of the monograph is not due primarily to such features. It lies, rather, in the fact that the authors have not been satisfied to present merely a detailed statistical analysis of psychometric

records. On the contrary, they have demonstrated with unusual skill that psychometric examination of the mentally ill can be made *psychiatrically* significant.

Thus, in a series of three fully documented discussions, the authors (1) dispute prevailing views as to the status of the intellect in dementia præcox, (2) describe a pattern of success and failure on the Stanford Binet characteristic of dementia præcox, and (3) challenge the classical concept of irreversible deterioration as an inherent part of the præcox process. A study of their data leads them to conclude:

(1) "... that the dementia præcox mind is blunted and dulled. This intellectual inferiority is not primarily due either to deterioration or to temporary impairment resulting from the psychosis, since it shows itself in extensive school failure long before the actual breakdown and, in most cases, before the occurrence of the first premonitory symptoms of the disease. While in some instances it may be congenital, our case histories suggest that more often it is the product of the emotional maladjustments which later play an important etiological rôle in the precipitation of the psychosis" (p. 44).

(2) "... that the dementia præcox are differentiated from the other groups represented not only by their lower intelligence level, but also by conspicuous failure in tests demanding relatively great expenditure of attention and effort. . . ." (p. 82). "Certainly it is only in this inability to sustain attention and mobilize sufficient effort to perform exacting tasks, and not the failure to think abstractly or to execute special operations, that appears to characterize dementia præcox intelligence. . . ." (p. 83).

(3) that "Despite the great weight of opinion, going back to Kraepelin's own statement that mental efficiency is always diminished to a certain extent in dementia præcox, we have not found evidence of deterioration in our patients. . . . Certainly, as the re-examinations indicate, there is no progressive decay of function during hospitalization" (p. 162). "... with accumulating evidence that the intellect remains intact even in profound regression, we must abandon or greatly modify our concept of deterioration in the psychosis" (p. 165).

While these excerpts may serve to indicate the general nature of the conclusions arrived at, they naturally give no idea of the detailed evidence upon which such conclusions are based. In examining this detailed evidence for himself, the critical reader may find arguments and inferences with which he is not fully in agreement, but he is certain to find them stated in such a way that they call for further experimental evidence rather than aimless disputation.

The monograph is paper-bound and published in planograph style. The typewriter print, although small, is exceptionally clear and the text is almost entirely free from typographical errors. It would be regrettable if the form in which this monograph appears were to do anything to discourage the careful scrutiny which it both deserves and requires.

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A REVIEW OF THE PSYCHONEUROSES AT STOCKBRIDGE. By Gaylord P. Coon, M. D., and Alice F. Raymond, A. B. (Stockbridge, Mass.: Austen Riggs Foundation Inc., 1940.)

This book is a "case study and statistical analysis conducted at Stockbridge from 1936-1939 of histories of patients during the years 1910-1934 and an evaluation of the therapeutic results." The material is chiefly restricted to 1060 cases diagnosed as "neurasthenia" or "anxiety neurosis."

Patients at Stockbridge are of a fairly uniform group in that the majority are in "comfortable or moderate" economic standing and belong more or less to the same social class. Likewise, the type of therapy practised is uniform and based on Dr. Riggs' formulation of the neurosis and his therapy of reeducation. Some time is spent in the present study in outlining this therapeutic approach and almost one-third of the volume is devoted to Dr. Riggs' now famous "Talks to Patients."

This study is based on follow-up observations obtained largely from questionnaires sent to former patients. Some very interesting responses were received which were of value. Nevertheless, the accuracy of the report is subject to the limits found in the questionnaire type of approach.

Protocols of 92 selected patients are given and these patients are divided into four groups. One gets the feeling that this "dynamic grouping" is arbitrary, superficial and lacks point. The handling of much of the material written by the patients also seems somewhat naive.

The statistical tables are clear and abundant and if the authors err in this respect it is on the side of too many tables, some of which seem irrelevant. However, they maintain an admirable self-critical attitude and warn the reader especially concerning the interesting "association tables" in the appendix.

What greatly enhances the value of this study is that it is made in an honest and cautious manner and purports to be no more than it is. There is an excellent passage on the pitfalls and limitations of the statistical analyses of therapy in the neuroses and the authors state, "it may be that the most significant factors in a psychiatric study are the very items whose qualitative nature precludes their handling by statistical methods."

Too few statistical studies on the effect of therapy in the neuroses have been made and this is certainly a welcome contribution. Broadly speaking 35 per cent of the cases surveyed benefited markedly from treatment and maintained a "good level of adjustment" for varying lengths of time. A favorable comparison is made with the few studies published from England, Germany and the United States.

This work is important in that it shows what can be expected in the way of successful treatment of a selected group of neurotic patients by means of an intensive but superficial and highly intellectualized therapeutic approach.

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L'IMAGE DE NOTRE CORPS. By *Jean Lhermitte*. (Paris: E'ditions de la Nouvelle Revue Critique, 1939.)

In this book the well-known French neurologist, Lhermitte, discusses the problem of the body image in a well organized manner, full of clinical examples, well grounded in sound neurologic knowledge. First is discussed the ontogenetic development of the body image and the influence of all deep and superficial sensory modalities. Then follow chapters on phantom extremities where amputation has taken place and where lesions of nerve roots and spinal cord exist. The best chapters are devoted to illusions, hallucinations and distortions of the body image in cerebral lesions and intoxications. Lhermitte comes to slightly different conclusions from some American authors regarding the focal lesion necessary for the production of anosognosia.

The last three chapters are devoted to a more strictly psychiatric aspect of the subject, especially with the hallucinatory phenomenon which the author calls "Héautoscopie." In this condition the subject feels that he has two bodies, separated in space and the actions and feelings of the dissociated self can be observed by the other. There follow literary allusions to the phenomenon culled from the writings of authors from Goethe to D'Annunzio; yet this section, so rich in clinical material, is in contrast to the first section of the book because of the absence of any dynamic psychologic approach. Lhermitte indicates briefly in two pages his misconception of psychoanalytic theory but one wonders how much of this is due to the fact that his only source of information is Schilder's *Image and Appearance of the Human Body*. He draws heavily throughout the book upon Schilder and Menninger-Lerchenthal for material.

It is not that Lhermitte is unaware of the importance of the dynamic approach. He writes here and there of the wishful aspect of certain symptoms and is cognizant of some of their secondary gains. But in the main he leaves the impression that the psychiatric phenomena about which he writes—depersonalization, illusions and hallucinations of the body—are explicable in terms of derangement of cortical function. The dynamics, however, are absent from the explanation and therefore one must conclude that such a theory is less adequate than others which have been proposed to explain the schizophrenic's statement that he has a thousand hands and feet, or the girl's hallucinatory experiences with two bodies as she struggles against seduction by the devil, to cite two examples given by Lhermitte.

Despite these theoretical defects in the latter part of the book the treatise deserves wide attention from neurologists and psychiatrists.

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MEN AGAINST MADNESS. By *Lowell S. Selling, M. D., Ph. D.* (New York: Greenberg, 1940.)

With no desire merely to "embalm facts," the author has described the lives and adventures of some of the more important contributors to the

development of mental medicine. His method is not the dry narration of conventional, terse, biographical and historical statement, but an easy-going, often rambling and digressive account such as one might listen to while sitting around the fireplace of a winter's evening. The style is popular, ingratiating and addressed to the non-medical reader, for many of the explanations assume lack of knowledge of physiology or of medical technical terms. The author's "principal objective, besides showing how madness has been fought, has been to show how human the researchers were and against what vicissitudes they had to struggle." To do this, he has adopted a story-teller's style with a mixture of scientific facts, imaginary conversations, political observations and anecdotes from the lives of characters in medical history.

It is easy to read and the pages go rapidly. One must know however in what spirit to take the volume, else if he looks for a staid and orthodox presentation of the famous dead he is likely to be startled to come across such statements as these, with which the book abounds: "We can at least be grateful to Galen for doing nothing"; "Meanwhile, Vesalius had given up doing research. He was living on his reputation. . . . There we have again our cagey Vesalius"; "But Descartes was a very bright little fellow." In describing a decerebrate pigeon, he writes that "the silly old pigeon if placed on a hot plate will lift one foot after the other, performing a little dance."

As in an informal talk, the book's tempo varies irregularly. One finds much more detail about Dorothea Dix than about Griesinger, Charcot, Kraepelin and Freud all together. If annoyed at first by the familiarity, the chattiness, the unevenness of the book, one soon begins to suspect that his annoyance may be due to an entrenched tradition that authentic information "ought" to be imparted in a ponderous, serious fashion. Here is no such book and Selling has not wished it to be such. Informative, refreshing, it will appeal to the lay reader especially, giving him a fair idea of some of the more significant backgrounds from which modern psychiatric methods and thought have evolved.

The psychiatrist too will enjoy much of the story. He will wish that less use had been made of the terms "madness" and "insane." He will deplore the statements: "All that the physician at the beginning of the twentieth century was able to do was to say, for instance, to a woman: 'your husband is insane'"; and: "psychiatrists have always hoped to regenerate and cure their patients. If, in the case of antisocial tendencies, this cannot be done, we immediately lose hope." He will regret that the non-medical reader is informed that the hysterical patient "is always both paralyzed and anesthetic on the same side," and that on finding his patient's pupils not reacting to a flashlight the doctor tells the nurse: "This man has paresis. His pupils don't react. I don't need to examine him any further. . . ." and later: "'Tomorrow morning we will give him some malaria treatments' and with that he has practically disposed of the case." Also it seems doubtful that "It is almost unheard of for a patient to resist

his admission to a (mental) hospital," and that "Where a generation ago it was to be presumed that, if a person had one manic attack, he was almost sure to have a second and third, nowadays it is the exception rather than the rule."

It is safe to say nevertheless that the physician as well as the layman will find this book informative of interesting details not elsewhere readily accessible and that in addition the reading will turn out to be fun.

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COMPENDIUM OF REGIONAL DIAGNOSIS IN LESIONS OF THE BRAIN AND SPINAL CORD. By *Robert Bing*. 11th edition, translated and edited by *Webb Haymaker*. (St. Louis: The C. V. Mosby Co., 1940.)

Bing's compendium has been well tested during the thirty years of its life. The volume is really a digest of neuroanatomy and neurophysiology applied to human disease. In plan it is devoted to the localization of lesions within the nervous system but the book is even more valuable for its discussion of the mechanism of signs and symptoms of disease. All important methods of physical diagnosis are dealt with and their significance explained. One cannot help but feel that both the title and the organization of material are unnecessarily austere for a book which embodies such a wealth of valuable material for the clinician.

The translation and format leave nothing to be desired. The book is profusely illustrated with diagrams, photographs and roentgenographs which are quite the clearest and most helpful that this reviewer has seen. Both the table of contents and the index are lucid and complete. The volume is warmly recommended as a *vade mecum* in the field.

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AS THE TWIG IS BENT. By *Leslie B. Hohman*. (New York: Macmillan, 1940.)

This book should fill a very definite place in parent education and child training. The subjects covered are of vital importance to workers in this field. There are however some factors which diminish the value of the book. It might have been condensed without loss of detail and with a definite improvement in readability. At times in his desire to get his message across to the reader, the author becomes wordy and a little abstruse.

This book is written on the premise that the habits of infancy and childhood are the determining factors of ideal behavior and personality. The author feels that the importance of hereditary factors is minimal and that adult behavior is almost entirely due to environment and training. This is a premise which many cannot accept as fully as does the author, but one which serves a definite purpose in giving to the parents an aggressive

plan of action with definite prospects of success and which avoids the attitude of defeatism so often associated with the acceptance of a hereditary origin for abnormal behavior.

The first chapter stresses the importance of adequate habit training and the disastrous results from poor habit training are propagandistic in type. The author even points out that the successful therapy of behavior problems is primarily based on the fact that bad habits persist because they bring some pleasurable return and vanish when that return ceases. Then follows a chapter on corporal punishment, its use and abuse, the importance of good companionship between parent and child and a sensible evaluation of modern education, the radio and movies. The importance of a work program and the benefits to be obtained from such in happiness and improved habits of work are then stressed.

The author next deals with the proper handling of a child during an illness and discusses the dangers which might arise from the relaxation of training and discipline. The development of good eating habits and of good emotional control is discussed, followed by the problems of lying, stealing, timidity, selfishness and jealousy. There are excellent chapters upon the importance of friendship in the development of satisfactory personality and the relationship between self-reliance and normal social maturation. The question of adequate sex education and the development of normal habits of sex are admirably dealt with in the last few chapters. In closing the author advises the parents to periodically consider their child's behavior and decide whether his habits will be a help or a hindrance in later life.

WM. A. HAWKE, M. D.,
University of Toronto.

PRACTICAL CLINICAL PSYCHIATRY. By *Edward A. Strecker, A. M., Sc. D., M. D.,* and *Franklin G. Ebaugh, A. B., M. D.,* with a Section on **PSYCHOPATHOLOGICAL PROBLEMS OF CHILDHOOD** by *Leo Kanner, M. D.* Fifth edition. (Philadelphia: The Blakiston Company, 1940.)

The present fifth edition of this standard text book (first edition, 1925) appears in slightly larger format than that of previous editions and contains some new material. The initial chapter on "Psychobiological Conceptions" has been expanded to include recent observations of various authors on the thinking processes. There is also a section summarizing Strecker's Salmon lectures published under the title "Beyond the Clinical Frontiers." In the chapter on "Methods of Psychiatric Examinations" several paragraphs dealing with the Rorschach test have been added.

The section on "Epilepsy and Epileptic Psychoses" has been modernized by the inclusion of references to the work of Lennox, Gibbs and Davis, with reproduction of electroencephalographic tracings. The conclusions of these authors as to the inheritance of cerebral dysrhythmia and epilepsy are quoted.

In the discussion of alcoholism new data and statistics have been incorporated (Dayton, Pollock), and recent treatment methods find mention.

Data on bromide intoxication have also been amplified. Of 11,440 cases routinely examined at the Colorado Psychopathic Hospital 4.28 per cent showed a bromide concentration in the blood of 75 mgm. per cent or over 7.7 per cent of 1,000 cases reported in the previous edition.

Material in the chapter on the manic-depressive psychoses has been rearranged and revised to take account of the later theories and therapies, including shock therapy and prolonged narcosis. "When used, shock therapy should merely supplement and in no way replace the medical and psychotherapeutic procedures outlined."

The authors devote a page to the surgical procedure (prefrontal lobotomy) inaugurated by Moniz and seem inclined to view the operation without disfavor in the treatment of certain chronic conditions.

In the discussion of schizophrenia the subject of pharmacologic shock therapy is dealt with in greater detail, with attention to technique and complications. The "total push" method of Myerson also finds mention. Incidentally the authors appear to be undecided about spelling, and write "Catatonia" and "Katatonia" in adjoining paragraphs.

The original case histories are retained and serve to illustrate the clinical conditions discussed. Kanner's excellent epitome of "Psychopathological Problems of Childhood" constitutes the final chapter in the book. Altogether the new edition brings up to date a concise textbook of proved usefulness.

C. B. F.

In Memoriam.

PAUL FERDINAND SCHILDER.*

1886-1940.

Paul Ferdinand Schilder was born in Vienna on February 15, 1886. He became interested early in the philosophies of Buechner, Schopenhauer, Nietzsche and Kant and contemplated studying classical philology and philosophy but finally chose medicine and received his degree of doctor of medicine from the University of Vienna in 1909. He was assistant at the psychiatric clinics at the Universities of Halle and Leipzig from 1909 to 1914. He served as medical officer in the Austrian army from 1914 to 1918, maintaining his habits of study while at the front, and he received his Ph. D. degree from the University of Vienna in 1917. From 1918 to 1928 he was on the staff of the psychiatric clinic of the University of Vienna and became first assistant under Wagner von Jauregg. He was on the medical faculty there from 1920 to 1929, being extraordinary professor from 1924 to 1929. During this time he was in personal contact with Freud and in close association with the Vienna psychoanalytical society.

He came to the United States in 1928 and was visiting lecturer at the Phipps Clinic of Johns Hopkins from 1928 to 1930. In 1930 he was appointed clinical director in the psychiatric division of Bellevue Hospital and research professor of psychiatry at New York University College of Medicine. He continued in these capacities until his untimely death, December 8, 1940. Dr. Schilder had just left the Doctors' Hospital where he had visited his wife, Dr. Lauretta Bender Schilder, and his eleven-day-old daughter, Jane, when he was struck by an automobile and died a few hours later without regaining consciousness.

* This memorial notice is taken from the Resolutions prepared by Dr. Karl M. Bowman and Dr. Frank J. Curran, and read before the Section on Neurology and Psychiatry of the New York Academy of Medicine and before the New York Neurological Society.

Dr. Schilder was a Fellow of the American Medical Association, The American Psychiatric Association and the New York Academy of Medicine. He was a member of the New York Neurological Society, the American Neurological Association, the New York Society for Clinical Psychiatry and the New York County Medical Society. He was one of the founders and was the first president of the Society for Psychotherapy and Psychopathology.

Dr. Schilder approached the study of psychiatry from many angles. His philosophical training provided one approach. His careful studies in neuropathology (under Weichselbaum and Froheim) and his constant attempt to link up psyche with soma led in 1913 to his classical description of encephalitis periaxialis diffusa ("Schilder's Disease"), a work which brought him international recognition when he was only twenty-seven years of age. With Neuman and Krueger, pupils of Wundt, he studied experimental and primitive psychology. In his book "Wahn und Erkenntnis" (Delusion and Knowledge), he studied the basic similarities between the thoughts of primitives and schizophrenics, but he remained keenly aware of the fundamental differences in the social settings of the schizophrenic and the primitive. His psychoanalytic studies caused him to be sympathetic to the psychogenic approach to many types of disorders. He was an omnivorous reader, had a thorough knowledge of the literature of neuropsychiatry and associated subjects and was continually attempting new formulations.

Although Schilder belonged to the Vienna Psychoanalytical Society and for a time to the New York Psychoanalytical Society, he himself was never psychoanalyzed and this brought him into controversy with the orthodox group of psychoanalysts. However, as a result of these controversies and discussions a broader and less rigid attitude towards psychoanalytic techniques was encouraged. He introduced group psychoanalysis in the Bellevue Mental Hygiene Clinic and was one of those responsible for short term psychoanalyses in selected cases.

Dr. Schilder's bibliography since 1909 shows 245 publications, several of which are entire volumes. This bibliography does not list papers published in 1940 nor those written but not yet published. In addition, he has written three other books, as yet unpublished, one dealing with art and sociology, one dealing with perception and thought, and one with goals and desires. At a recent

memorial service sponsored by the Society for Psychotherapy and Psychopathology, a resolution was made that a committee be formed to secure funds by general subscriptions from colleagues, students, friends and patients to defray the cost of publishing these three volumes.*

Dr. Schilder's interests were extraordinarily catholic. At New York University College of Medicine he will probably be best remembered for his great interest in the students and his stimulating effect upon them. One result was the organization of a Psychological Club among the students, and in addition, voluntary extracurricular courses dealing with various phases of psychiatry were given to enthusiastic groups. In Bellevue Hospital he was outstanding as a teacher and clinician, always suggesting problems to the younger men. He had a keen wit and kindly sense of humor. He was a genuine friend and a loyal colleague.

Dr. Schilder was first married in 1919 to Maria Christine Moser and was divorced from her in Reno in 1936. His second wife was Dr. Laurretta Bender, associate professor of psychiatry at New York University College of Medicine, who has collaborated with him in a great deal of his work during the more recent years.

Dr. Schilder is survived by his second wife, and by their three children Michael, Peter and his infant daughter, Jane, as well as by his mother and brother who are living somewhere in occupied France.

KARL M. BOWMAN, M. D.

FRANK J. CURRAN, M. D.

*Dr. Bernard Glueck is chairman of this committee; Dr. Frank J. Curran, secretary. Contributions may be sent to Dr. Curran at 404 E. 55th St., New York City.

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